magellan
GROUND CONTROL

MAGELLAN MSS - Mobile Satellite Internet System

SYSTEM ACTIVATION MANUAL

For Internal Use Only
Updated 6-13-05

Table of Contents

PRE-INSTALLATION – BEFORE THE INSTALL 3

1. OBTAINING A "SAN & PIN" NUMBER 3
2. WHAT YOU NEED FROM THE CUSTOMER IF THEY LEAVE 4
3. SETTING UP THE INSTALLERS LAPTOP 4

SYSTEM ACTIVATION 7

STEP 1 - CHECK ALL CONNECTIONS 7
STEP 2 – TURN ON THE MAGELLAN SYSTEM 8
STEP 3 – PLUG INSTALLER LAPTOP INTO ROUTER 9
STEP 4 – ACCESS THE MAGELLAN ADMINISTRATIVE SCREEN 9
STEP 5 – CALIBRATE THE COMPASS 10
STEP 6 – FIND SATELLITE 11
STEP 7 – COMMISSIONING THE DW6000 MODEMS 13
STEP 8 – TESTING YOUR INTERNET CONNECTION 20
STEP 9 – CONFIGURING EMAIL ACCOUNTS 22
STEP 10 – OPTIMIZE YOUR INTERNET CONNECTION 22
STEP 11 – CONFIGURE THE ROUTER/WI-FI ACCESS POINT 22
STEP 12 – TEST THE REMOTE CONTROL PANEL 28

APPENDIX A – EXPLANATION OF MAGELLAN MAIN SCREEN 30

APPENDIX B – DIRECWAY RX & TX ERROR CODES 34

APPENDIX C – TROUBLESHOOTING YOUR WI-FI CONNECTION 37

APPENDIX D – PERFORMING A CROSS POL MANUALLY 37

APPENDIX E – UPGRADING YOUR MAGELLAN FLASH SOFTWARE 44

APPENDIX F – TROUBLESHOOTING 44

INTRODUCTION

The Ground Control MAGELLAN MSS is a self-contained automatic pointing mobile Wi-Fi hot-spot satellite Internet network system. Try saying that three times fast.

If you're reading this manual, you've probably just physically installed the MAGELLAN and want to activate the system so that it may connect to the Internet at the touch of a button.

In this manual, we will review cable connections, calibrate the dish, commission the Direcway DW6000 modems, configure the Linksys Router Wireless Access Point, and do a number of other tasks that will make your customer's experience with the MAGELLAN a liberating experience of mobile connectivity.

PRE-INSTALLATION – BEFORE THE INSTALL

Some of the Pre-Installation procedures below were covered in the previous Hardware Installation manual.

1. OBTAINING A "SAN & PIN" NUMBER

Play it safe and request your "San & Pin" number from Ground Control to commission your DW6000 satellite modems a day or two BEFORE you go on an installation. Please visit this Ground Control Partners Page (under partner supplies) to download the "Bandwidth Activation Form".

BANDWIDTH ACTIVATION FORM
This form will ask what satellite you are turning your customer on to, and what grade of service they are purchasing.

You will need to know these following items before you request a San & Pin from Ground Control.

- Customer Name, Address, Phone Number
- The DW6000 (or IRU) Serial Number
- They type of bandwidth service requested
- If the customer wishes a Public IP address or not
- Which satellite they wish to commission to (there are several).
- The customer credit card information for monthly billing
- Whether or not they want TV (which may affect which satellite they may commission to)

Please Contact Ground Control Dealer Services for help in filling out your Bandwidth Activation form at 805-783-4620 during normal business hours.

2. WHAT YOU NEED FROM THE CUSTOMER IF THEY LEAVE

Most of the time, the customer will not be present when you are doing the bulk of your work. Because of this, you will absolutely need some things from them.

- Keys to the Rig (in case you have to move it).
- How to turn on and off power in the Rig (lights too)
- The password (if any) to their computer system.
- Their cell phone number. If they do not have a cell phone, it is wise to provide them one.

3. SETTING UP THE INSTALLERS LAPTOP

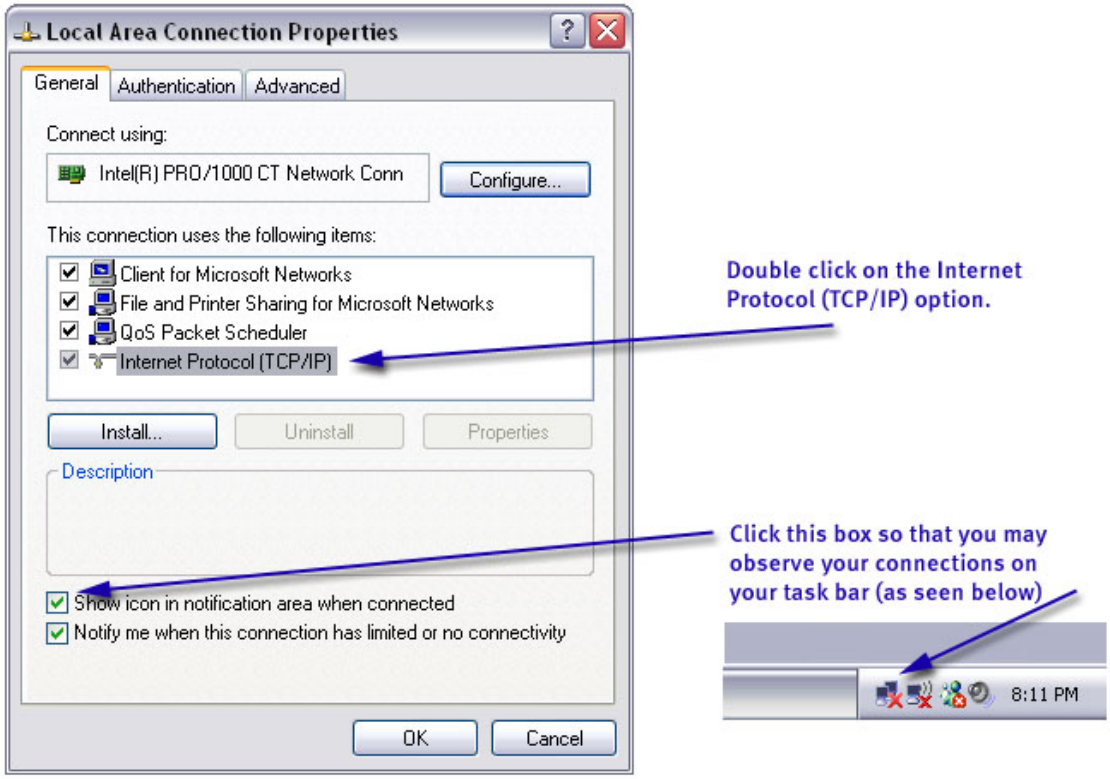
Because the MAGELLAN is a self-contained system and doesn't require a connected computer to operate, the only thing that needs to be set up on your installer laptop is the network settings so you may communicate with the MAGELLAN.

IMPORTANT NOTE – The Wi-Fi feature of the router that ships with the MAGELLAN is turned on (by default). However, some customers may not desire Wi-Fi connectivity for one reason or another. In this case, the Wi-Fi feature of the router may easily be disabled. If the Wi-Fi feature is disabled, ONLY computers connected by an Ethernet cable to the router may communicate with the router.

In this manual, we're going to configure your network settings when your laptop is directly connected to the router with an Ethernet cable.

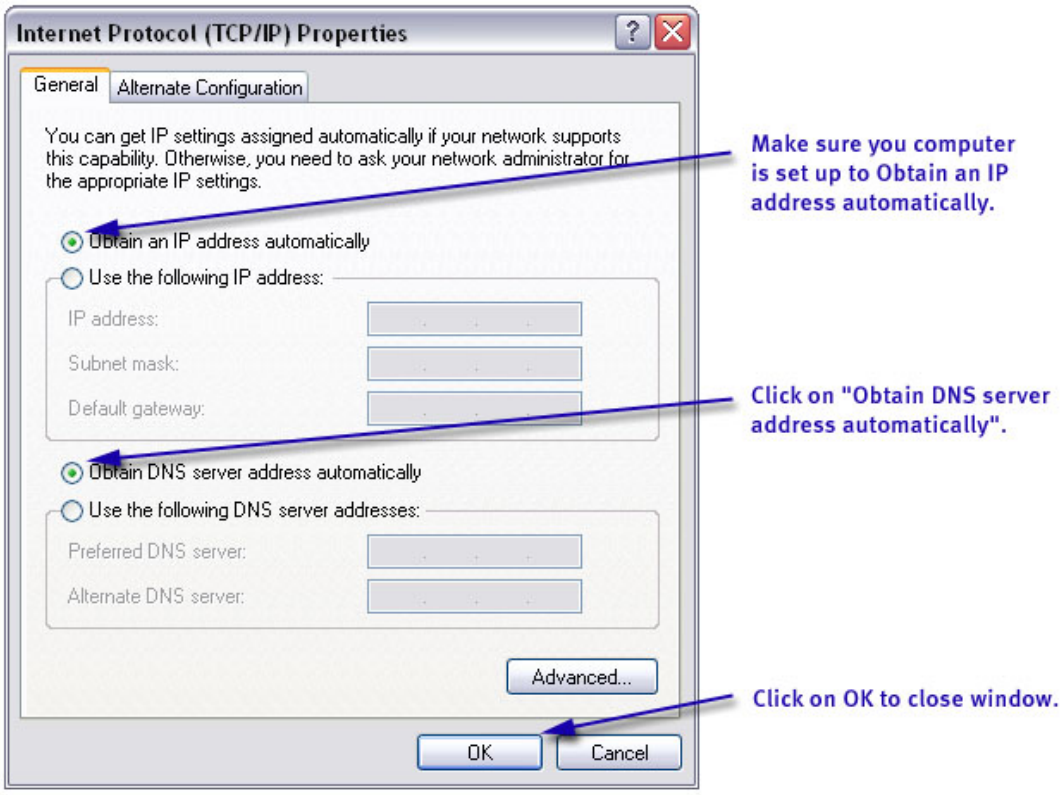
Click on START and open up the Control Panel window.

From inside of the Control Panel, find and open "Network" or "Network Connections".



Make sure that you click on the box that allows you to see your current network connection. Double-clicking on the task bar icon opens up the “Network Connections” window you open up from the control panel earlier.

Double-clicking on the “Internet Protocol (TCP/IP) option opens up the window below.

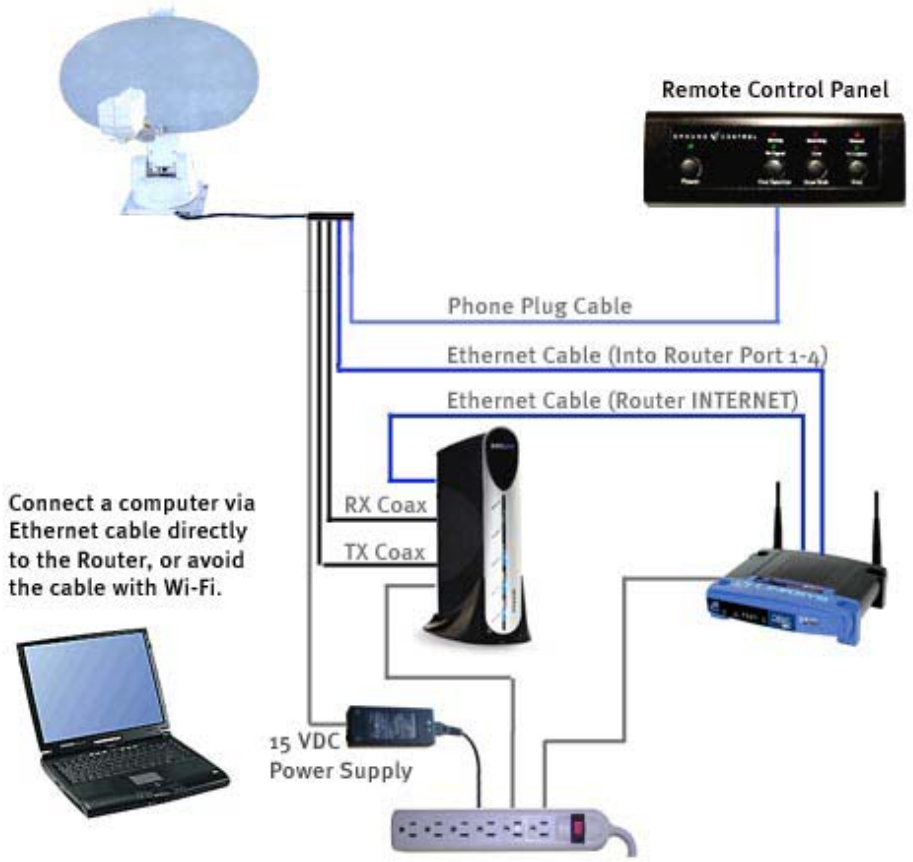

Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel
Make sure you computer is set up to Obtain an IP address automatically.
Click on "Obtain DNS server address automatically".
Click on OK to close window.

By obtaining an IP address automatically, you are setting your computer for “DHCP” communication with the router so that it can communicate with the router with ease.

SYSTEM ACTIVATION

STEP 1 - CHECK ALL CONNECTIONS

Make sure all of your wires are connected properly from the MAGELLAN Hardware Installation. Below is a schematic of a correctly connected MAGELLAN system.


Remote Control Panel
Phone Plug Cable
Ethernet Cable (Into Router Port 1-4)
Ethernet Cable (Router INTERNET)
RX Coax
TX Coax
Connect a computer via Ethernet cable directly to the Router, or avoid the cable with Wi-Fi.
15 VDC
Power Supply

There are 5 cables that come down from the MAGELLAN that connect to 3 different components.

1. The RX Coax Cable that connects to the DW6000 Modem
2. The TX Coax Cable that connects to the DW6000 Modem.
3. The Ethernet Cable that connects to the Router (Port 1-4).
4. A Phone Cable that connects the remote control.
5. Power Cable that supplies the dish with 15VDC power (via a supplied 15V Power Supply)

The MAGELLAN was designed to work well when all components are turned off and on from a power bar switch. Note that a computer is not part of the MAGELLAN system. Also the MAGELLAN is a self-contained Wi-Fi satellite system, which means that all components may be located in the same cabinet and not necessarily where the computer workstation(s) located.

DRYDOCKING - For those who need to draw as little power as possible, the customer may turn off just the MAGELLAN (by simply unplugging it) and it will not affect surfing traffic. Of course the dish must have acquired satellite before it can be unplugged.

The DW6000 Direcway Modems will supply the Internet connection to the Linksys Router. A standard Ethernet cable runs from the single Ethernet port on the back of the DW6000 to the "Internet" port on the back of the Router.

The Ethernet cable from the dish is used for communication and is connected to one of the Routers 4 ports. The dish communicates with the DW6000 modems as well as gives any connected computer access to the MAGELLAN Administrative screen.

The small Remote Control Panel is connected to a single phone wire from the dish. This device is optional and the MAGELLAN will work fine without it, although you must use the MAGELLAN Administrative Screen through a browser to control the dish.

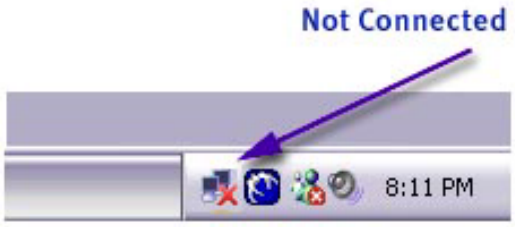
The Remote's small size (6 ¼ inches wide) allows it to be mounted almost anywhere or on any surface. Some of your customers may use this panel almost exclusively when operating the MAGELLAN.

STEP 2 – TURN ON THE MAGELLAN SYSTEM

Flip the switch on the power bar to all connected MAGELLAN equipment. (Dish, Router, DW6000 Modems).

STEP 3 – PLUG INSTALLER LAPTOP INTO ROUTER

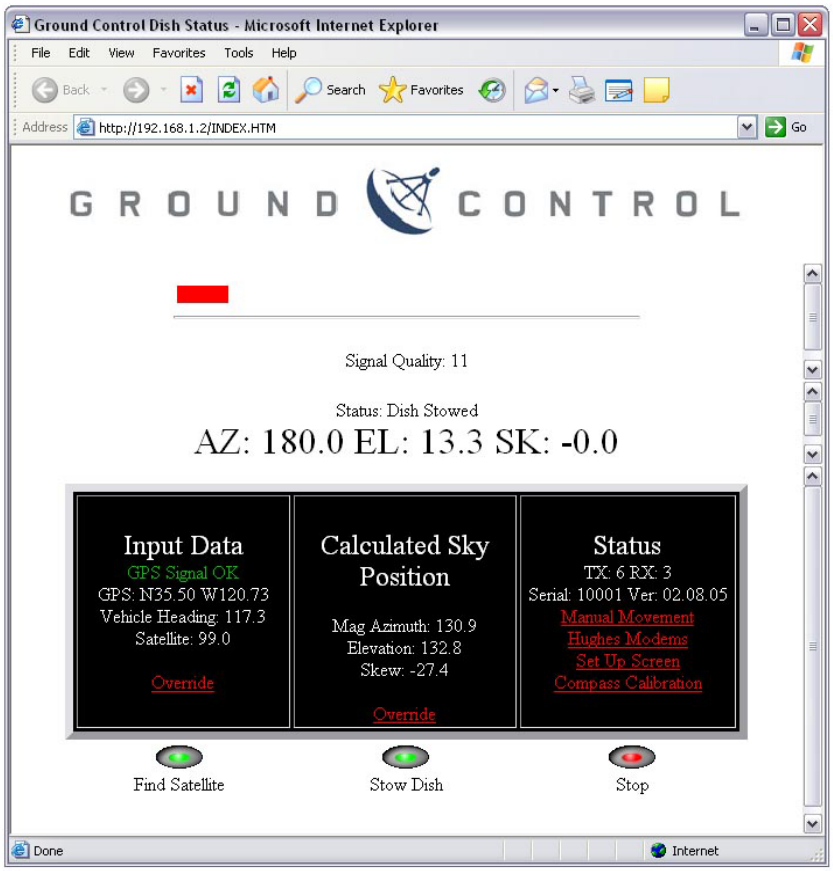
Use a standard Ethernet cable to connect your laptop to any of the 4 Router ports.



Note the task bar status window of your network connection will show that your computer is connected to the router. If you double click on this task bar icon, you will get the Local Area Connection Status window, as seen below.

STEP 4 – ACCESS THE MAGELLAN ADMINISTRATIVE SCREEN

Open a browser and type in 192.168.1.2 on the Address line to access the MAGELLAN Administrative Screen.



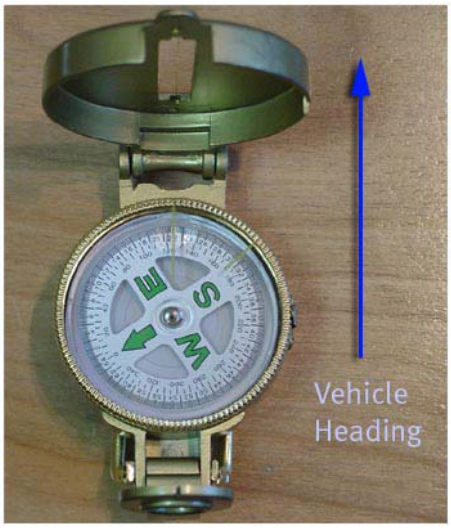
The MAGELLAN Administrative Screen will appear. (If it does not appear, check that all cables are connected, reboot everything and try again).

For an explanation of the MAGELLAN Administrative Screen, please visit **APPENDIX A** of this manual.

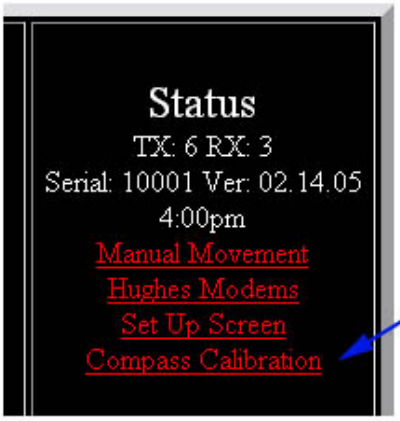
TRICK - REMOVING THE ANNOYING CLICKING ON REFRESH – The MAGELLAN Main screen is constantly refreshing itself and this makes an annoying clicking sound. This is an Internet Explorer oddity, but the good news is that this sound may be deactivated. To do so, open up the Windows Control panel (from the START button) and select **Sounds and Audio Devices** (XP) or **Sounds and Multimedia** (Windows 95-98-2000). Select the SOUNDS tab at the top of the window. Scroll down to the Program Events window until you see the "Windows Explorer" section. Highlight the "Start Navigation" listing. Now use the drop down menu to select "None" and then click on Apply. That's it! The refresh clicking will disappear… Unfortunately, this is a system wide event and Windows does not have a sound fix for individual web pages.

STEP 5 – CALIBRATE THE COMPASS

Before you can have the dish accurately find the satellite, you must calibrate the compass. To do this, you'll need a handheld magnetic compass or at least know the direction the vehicle is headed.

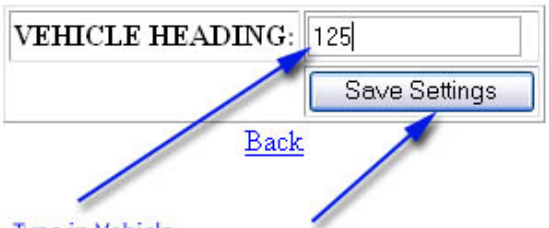


Pointing the compass toward the vehicle heading, the compass reads 125 degrees.



Click on Compass Calibration to set the compass to the vehicle heading.

Click on Compass Calibration

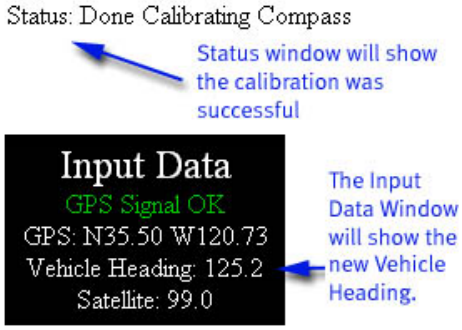


Type in Vehicle Heading

Press "Save Settings" to begin compass calibration.

Then enter in the vehicle heading

Once you click on "Save Settings" the dish will move about for about 6 to 10 minutes and then "Finish" the calibration. The dish will not stow after the dish compass has calibrated.


Status: Done Calibrating Compass
Status window will show the calibration was successful
Input Data
GPS Signal OK
GPS: N35.50 W120.73
Vehicle Heading: 125.2
Satellite: 99.0
The Input Data Window will show the new Vehicle Heading.

After the calibration, the Vehicle Heading of the Administrative window should match (within 1-2 degrees) the vehicle heading you entered.

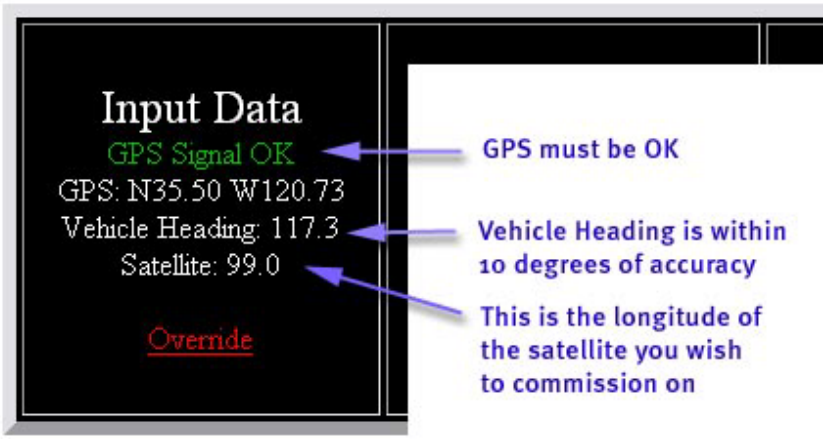
That's it for compass calibration… You do not need to move the vehicle.

STEP 6 – FIND SATELLITE

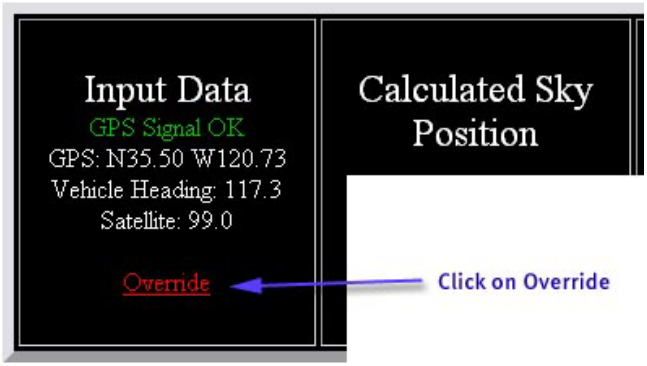
To begin commissioning the Direcway modem, you'll have the MAGELLAN find satellite. The problem is that if you press on the "Find Satellite" button before you perform a compass calibration, the dish may be searching for the satellite in the wrong part of the sky. Please take good notes on this process:

COMMISSIONED MODEMS - If the modems you have are already commissioned, you may simply press "Find Satellite" on the Administrative Screen and skip the rest of this step entirely. The MAGELLAN will automatically point the dish and Auto Cross Pol the to the commissioning state of the DW6000. This is a great feature for those who want to have two DW6000 modems commissioned on different satellites, a great backup feature! Simply swap out the modem, and reboot the whole system.

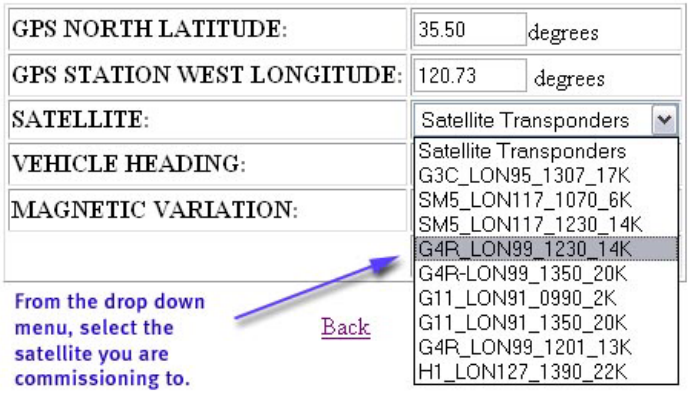
First, remember that Direcway Modems can only be commissioned when the satellite dish is locked on a Direcway satellite (passing cross pol)… AND… you have a San & Pin number from Ground Control. You will be unable to proceed unless you have this number.


Input Data
GPS Signal OK
GPS: N35.50 W120.73
Vehicle Heading: 117.3
Satellite: 99.0
Override
GPS must be OK
Vehicle Heading is within 10 degrees of accuracy
This is the longitude of the satellite you wish to commission on

Now, on the main MAGELLAN screen, make sure that GPS is OK, and that vehicle heading appears to be correct. Satellite 99 (G4R) is the only working commissioning satellite the MAGELLAN can pass cross-pol with a non-commissioned modem. It's okay to commission the modem on G4R even if you will be connecting to a different satellite later.



Once GPS and Vehicle heading are correct, you will need to manually select the satellite and a commissioning transponder from the "Override" screen.

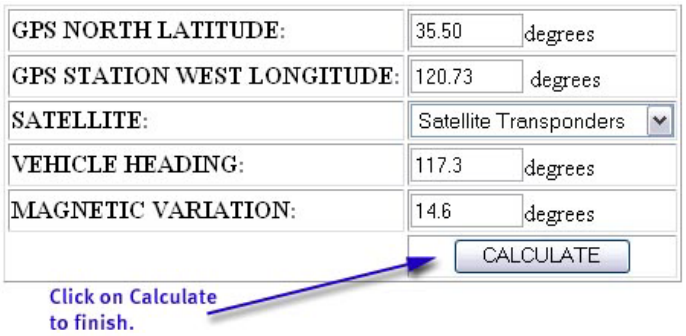


Select one of the G4R transponders (there are only two listed here), (1230_14K and 1350_20K).

Here is how to read this list:

- G3C, SM5, G4R, G11, and HI are the formal names of the satellite.
- LON95, LONG117, LON99, LON91, and LON127 are the "LONgitudes of their respective satellites.

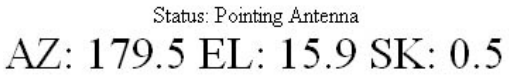
- 1308_17K, 1070_6K, 1230_14K, 1350_20K… are the transponders. Note how most satellites have more than one transponder for that satellite. Select any transponder.



You must press on the "CALCULATE" button to record your selection. The main screen will automatically appear.

Now click on "Find Satellite".

You can watch the Azimuth, Elevation and Skew angles change in the admin window.



The dish should find the satellite and perform and pass a "cross pol" in about 3 to 7 minutes. Please review **APPENDIX D** for more information on what "Cross Pol", or "ACP" is. Once the dish has passed cross pol, you may begin to commission the DW6000 modems.

TROUBLESHOOTING TIPS - If the dish fails to find satellite, try changing do a different transponder on that satellite (see above). If the dish does find satellite but doesn't pass cross pol… Try pressing on Find Satellite again and giving the dish a 2nd chance. If it again finds satellite, but again fails to pass cross pol, then you will need to perform the cross pol yourself, and you can use any Satellite, (not just G4R). Instructions on how to do this are in APPENDIX D – PERFORMING A CROSS POL MANUALLY. This is also a good place to learn about what Cross Pol is.

STEP 7 – COMMISSIONING THE DW6000 MODEMS

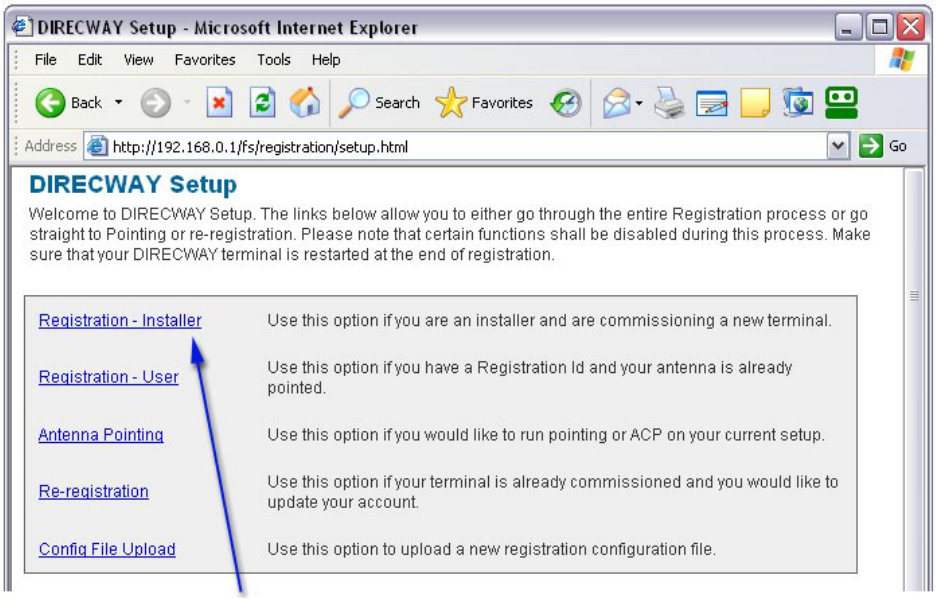
Once upon a time you had to find a phone connection to connect to your computer's modem to commission a set of Direcway modems. As you can imagine, this was extremely inconvenient for a mobile installation. Today however, the commissioning process can take place anywhere you can a Direcway satellite, which is perfect for mobile installs. You can literally be anywhere and install and commission a MAGELLAN system.

Okay,.. before you start the commissioning, make sure that you have your SAN & PIN number from Ground Control.

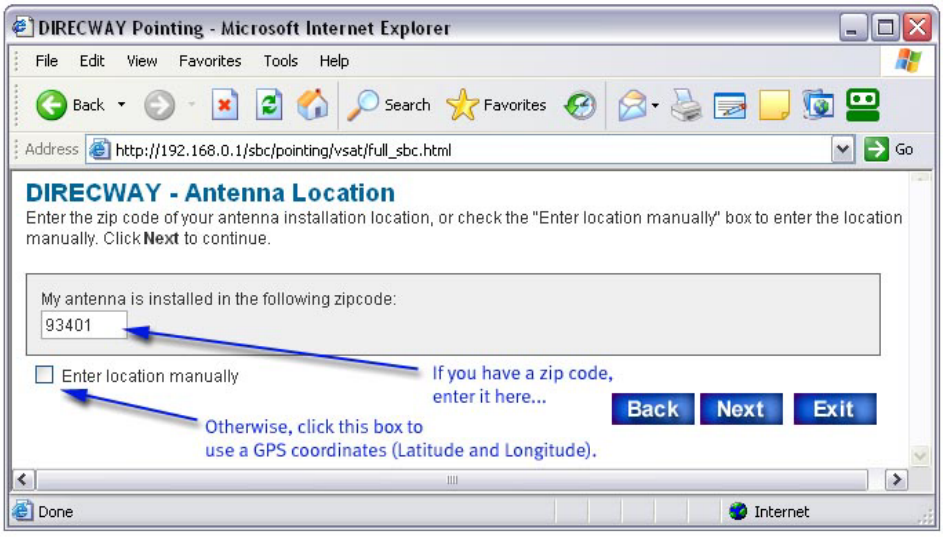
From the last step, the MAGELLAN is locked on satellite and has passed cross pol. Now we want to bring up the Direcway Setup window by typing in this URL:

http://192.168.0.1/fs/registration/setup.html

TIP - You should have the URL in your Favorites list for easy access.

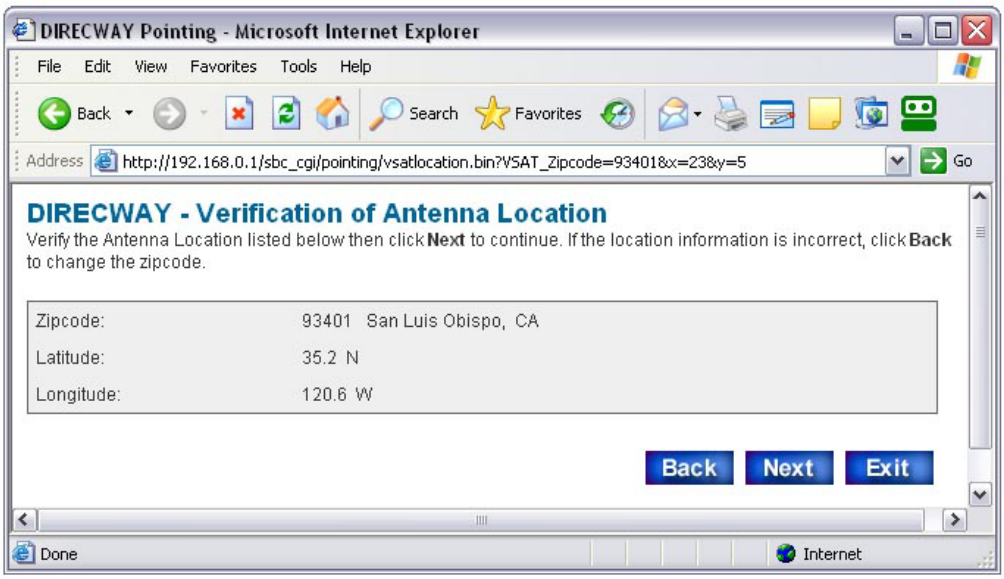

DIRECWAY Setup - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://192.168.0.1/fs/registration/setup.html
Go
DIRECWAY Setup
Welcome to DIRECWAY Setup. The links below allow you to either go through the entire Registration process or go straight to Pointing or re-registration. Please note that certain functions shall be disabled during this process. Make sure that your DIRECWAY terminal is restarted at the end of registration.
Registration - Installer
Use this option if you are an installer and are commissioning a new terminal.
Registration - User
Use this option if you have a Registration Id and your antenna is already pointed.
Antenna Pointing
Use this option if you would like to run pointing or ACP on your current setup.
Re-registration
Use this option if your terminal is already commissioned and you would like to update your account.
Config File Upload
Use this option to upload a new registration configuration file.

Click on "**Registration – Installer**". Make sure you <u>do not</u> use "Registration – User" in this installation, or you will have to decommission the entire system which takes over 24 hours to perform.

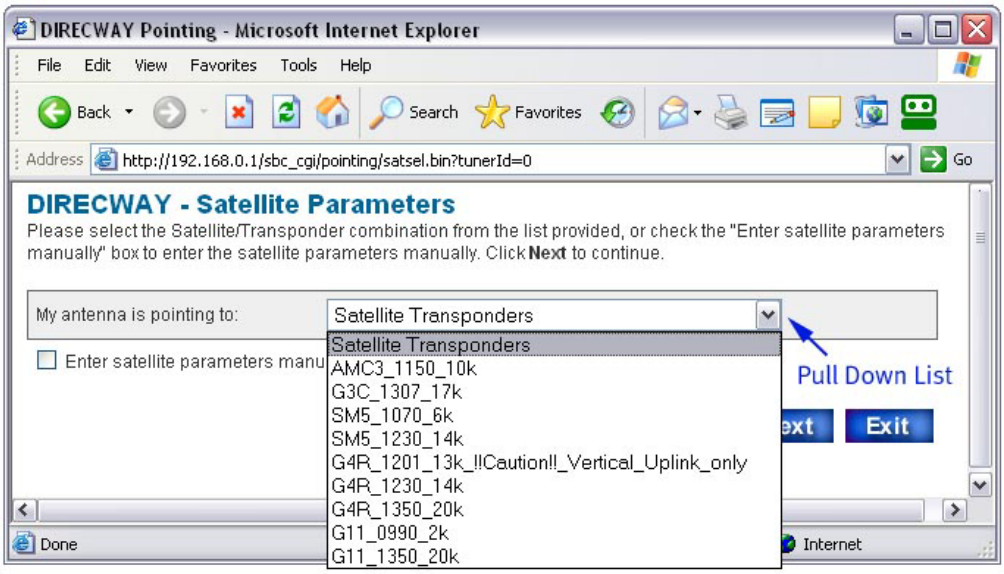

DIRECWAY Pointing - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://192.168.0.1/sbc/pointing/vsat/full_sbc.html
Go
DIRECWAY - Antenna Location
Enter the zip code of your antenna installation location, or check the "Enter location manually" box to enter the location manually. Click Next to continue.
My antenna is installed in the following zipcode:
93401
Enter location manually
If you have a zip code, enter it here...
Otherwise, click this box to use a GPS coordinates (Latitude and Longitude).
Back
Next
Exit
Done
Internet

Enter your Zip Code, or check the box next to "Enter Location Manually" if you know the latitude and longitude of the dish. It is important to have correct information for the zip code because this affects the timing of the dish. If timing is not accurate, the satellite system will not work for commissioning.

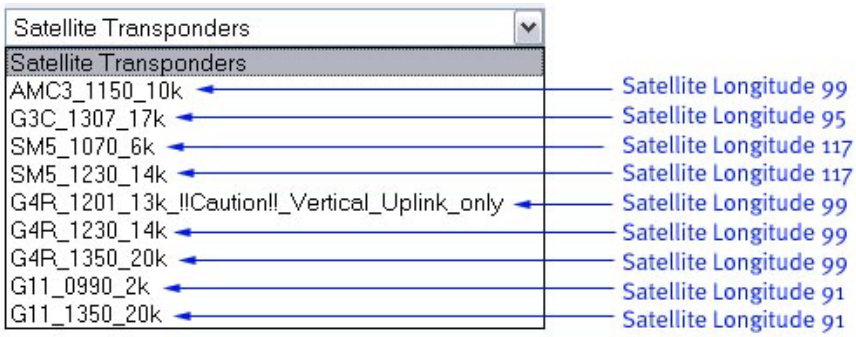
Many installers have a handheld GPS device to give them exact Latitude and Longitude Coordinates from anywhere on the planet. The GPS on the MAGELLAN works just as well.


DIRECWAY Pointing - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://192.168.0.1/sbc_cgi/pointing/vsatlocation.bin?VSAT_Zipcode=93401&x=23&y=5
Go
DIRECWAY - Verification of Antenna Location
Verify the Antenna Location listed below then click Next to continue. If the location information is incorrect, click Back to change the zipcode.
Zipcode: 93401 San Luis Obispo, CA
Latitude: 35.2 N
Longitude: 120.6 W
Back Next Exit
Done
Internet

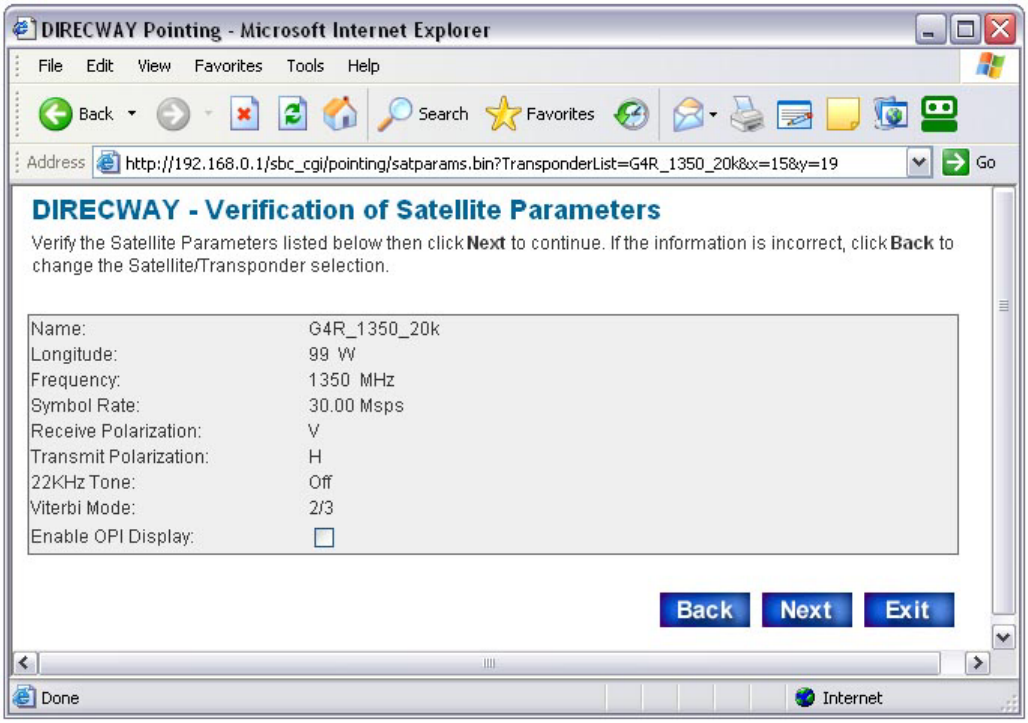
Verify the address is correct, and click on "Next".



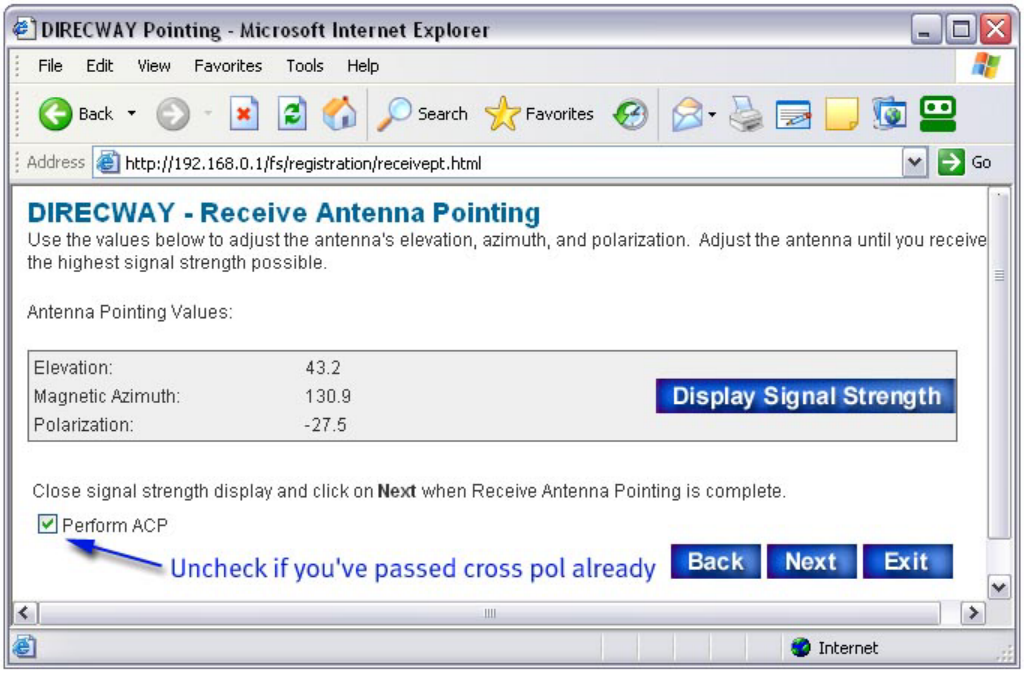
Select the satellite, and one of the transponders with that satellite. Below is a chart that shows the longitudes of each of the satellites.



In this case, since we locked on satellite on G4R (Satellite 99) transponder 1350_20K from the previous step, we'll choose that same transponder here, and then click on the "Next" button. (Note that it does not matter which transponder you use as long as it is on the satellite you are connected with).

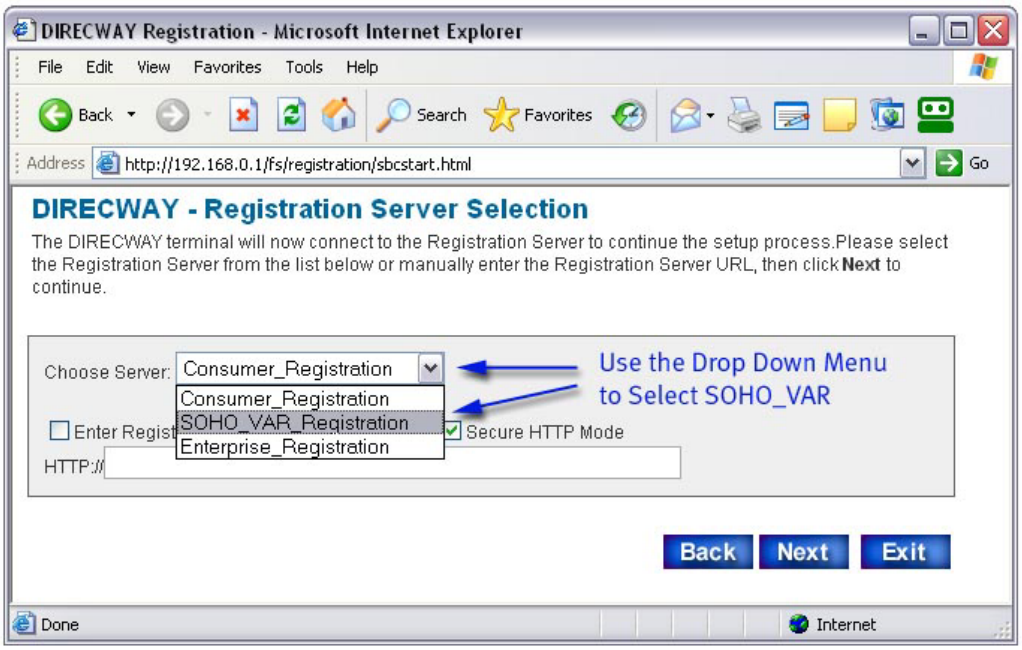

DIRECWAY Pointing - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://192.168.0.1/sbc_cgi/pointing/satparams.bin?TransponderList=G4R_1350_20k&x=15&y=19
Go
DIRECWAY - Verification of Satellite Parameters
Verify the Satellite Parameters listed below then click Next to continue. If the information is incorrect, click Back to change the Satellite/Transponder selection.
Name: G4R_1350_20k
Longitude: 99 W
Frequency: 1350 MHz
Symbol Rate: 30.00 Msps
Receive Polarization: V
Transmit Polarization: H
22KHz Tone: Off
Viterbi Mode: 2/3
Enable OPI Display:
Back Next Exit
Done
Internet

Verify the above screen is correct (which it should be) and then click on “Next”.


DIRECWAY Pointing - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://192.168.0.1/fs/registration/receivept.html
Go
DIRECWAY - Receive Antenna Pointing
Use the values below to adjust the antenna's elevation, azimuth, and polarization. Adjust the antenna until you receive the highest signal strength possible.
Antenna Pointing Values:
Elevation: 43.2
Magnetic Azimuth: 130.9
Polarization: -27.5
Display Signal Strength
Close signal strength display and click on Next when Receive Antenna Pointing is complete.
Perform ACP
Uncheck if you've passed cross pol already
Back Next Exit
Internet

The MAGELLAN should have already passed cross pol when it locked on satellite. If you believe you have not passed cross pol (ACP), please visit APPENDIX D

Click on the “Next” button to make the next screen appear:


DIRECWAY Registration - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://192.168.0.1/fs/registration/sbcstart.html
Go
DIRECWAY - Registration Server Selection
The DIRECWAY terminal will now connect to the Registration Server to continue the setup process.Please select the Registration Server from the list below or manually enter the Registration Server URL, then click Next to continue.
Choose Server: Consumer_Registration
Consumer_Registration
SOHO_VAR_Registration
Enterprise_Registration
Use the Drop Down Menu to Select SOHO_VAR
Enter Regist
Secure HTTP Mode
HTTP://
Back Next Exit
Done
Internet

On the above screen, you will need to click on the drop down menu and select "**SOHO_VAR_Registration**". Ground Control is a Business Class VAR of Direcway. Click on "Next" when this has been selected.

DIRECWAY - Registration In Progress
Satellite connection established
Encryption Keys downloaded
Authentication successful
The DW6000 modems connects to the registration server and download the Encryption keys as shown on this screen
Click Next to continue.
Click on Next
Back Next Exit

This status screen shows the progress of the DW6000 modem as it connects to the registration server. Once it has completed, click on the "Next" button.

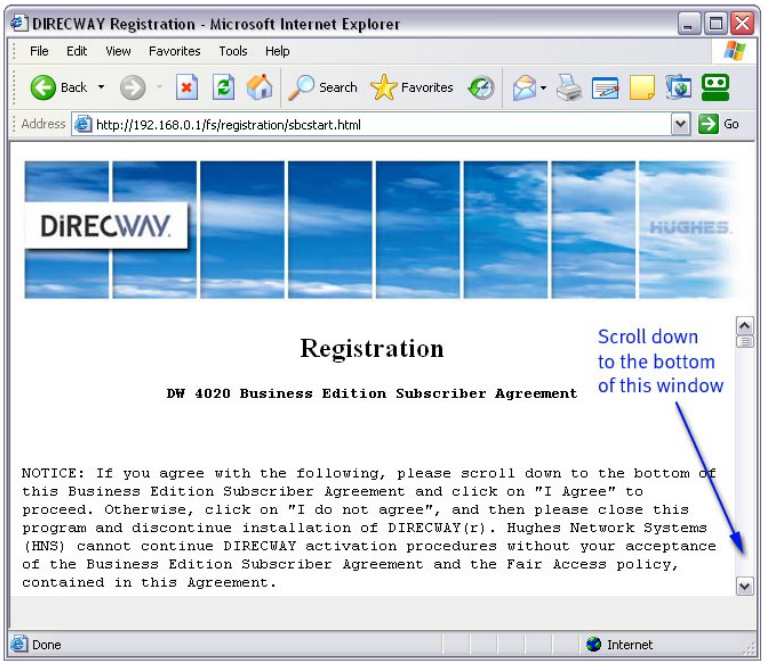
Microsoft Internet Explorer
You will now be redirected to the Registration Server. The server uses secure HTTP to encrypt all data transactions. Depending upon your browser settings, you may see some messages before you can proceed with the Registration process. Some pages may take a few minutes to download. Please be patient through the rest of the registration process.
OK
Click on OK

This warning message pops up and states that the registration process will sometimes take a few minutes. Click on OK.

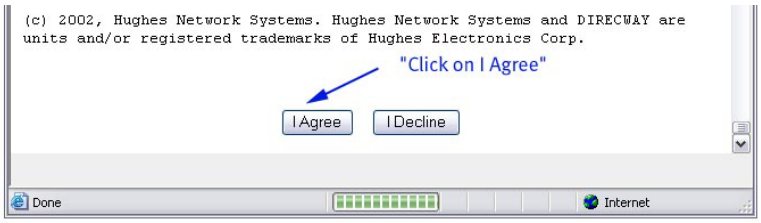
Security Alert
Information you exchange with this site cannot be viewed or changed by others. However, there is a problem with the site's security certificate.
The security certificate is from a trusted certifying authority.
The security certificate has expired or is not yet valid.
The name on the security certificate is invalid or does not match the name of the site
Do you want to proceed?
Click Yes to Proceed
Yes
No
View Certificate

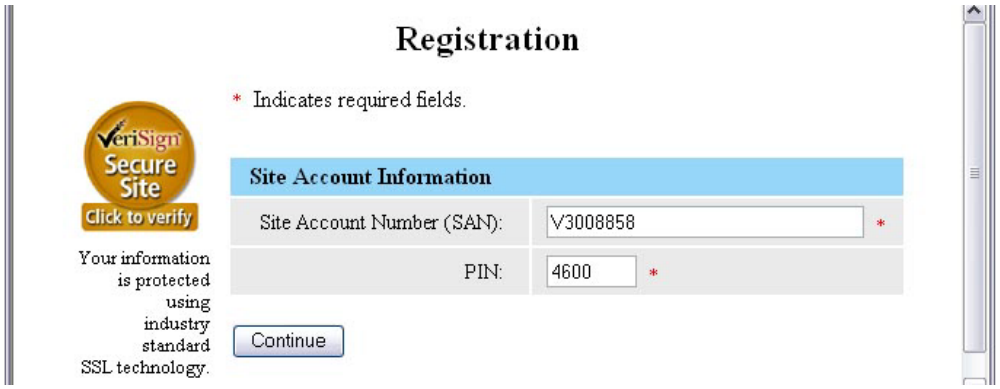
This pop up window above may appear… click on Yes to proceed.

The bottom of the browser window will show that you must wait for the registration server to communicate with the DW6000 modems.


DIRECWAY Registration - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://192.168.0.1/fs/registration/sbcstart.html
Go
DIRECWAY
HUGHES
Registration
DW 4020 Business Edition Subscriber Agreement
Scroll down to the bottom of this window
NOTICE: If you agree with the following, please scroll down to the bottom of this Business Edition Subscriber Agreement and click on "I Agree" to proceed. Otherwise, click on "I do not agree", and then please close this program and discontinue installation of DIRECWAY(r). Hughes Network Systems (HNS) cannot continue DIRECWAY activation procedures without your acceptance of the Business Edition Subscriber Agreement and the Fair Access policy, contained in this Agreement.
Done
Internet

The subscriber agreement appears. Have the customer read this page and click on the “I Agree” button on the bottom of this page.


(c) 2002, Hughes Network Systems. Hughes Network Systems and DIRECWAY are units and/or registered trademarks of Hughes Electronics Corp.
"Click on I Agree"
I Agree
I Decline
Done
Internet



Enter the SAN and PIN number supplied to you by Ground Control and then press on "Continue".

This screen above shows that the SAN and PIN was recognized as this customer. Make sure that the name in this window matches the name of the customer you are commissioning. If not, contact Ground Control technical support. Click on "Continue" to advance to the screen below.

Registration
Your account is registered for service.
Please write down the following information about your satellite terminal.
Site Id: 32212C01
Terminal IP Address: 192.168.0.1
Terminal Subnet Mask: 255.255.255.0
Use the above information to configure IP devices connected to the satellite terminal.
The default Gateway on each IP device should be set to the Terminal IP Address.
Print this page
Continue

The Site ID is the Direcway Commissing number for this customer. The Terminal IP address is the address of the Direcway modem. Write down, or print this page for you and your customer's benefit. Click on "Continue" to advance to the screen below: If the customer has a Static IP address, it will be listed here.

DIRECWAY - Registration Complete
DIRECWAY Registration has completed successfully. Click on the Restart button to restart your terminal.
Restart
Click on Restart

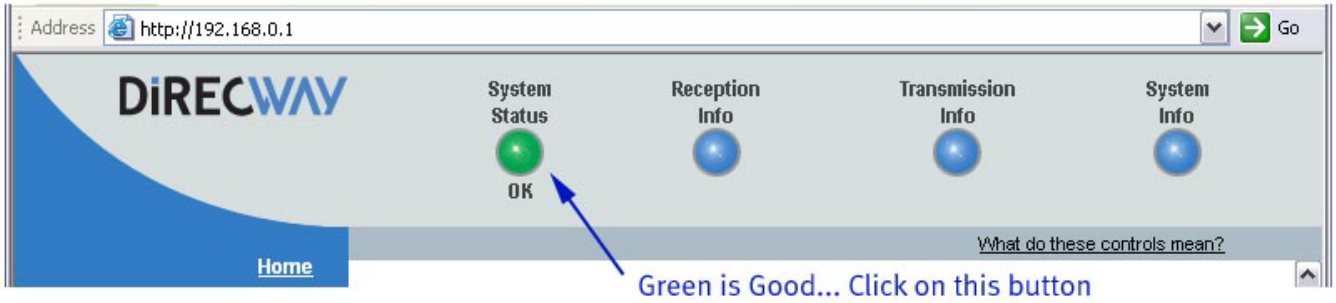
The commissioning process is over… Simply click on Restart and you should be surfing the net in a few seconds!

STEP 8 – TESTING YOUR INTERNET CONNECTION

If all goes well, you should be able to start surfing right now. In some cases, you'll need to reboot the whole system, and press on "Find Satellite" again. This is the case if you've commissioned on a different satellite from the one that you wish to use for your Internet connection.

Try bringing up a web page right now…

Now, let's look at the Direcway DW6000 Administration Screen:
Type in http://192.168.0.1 and press return:



The window below will appear when you click on System Status. It shows the current state of the DW6000 connection… If there were any errors, they would show up on this screen. An explanation of all the Transmit and Receive codes can be found in APPENDIX B.

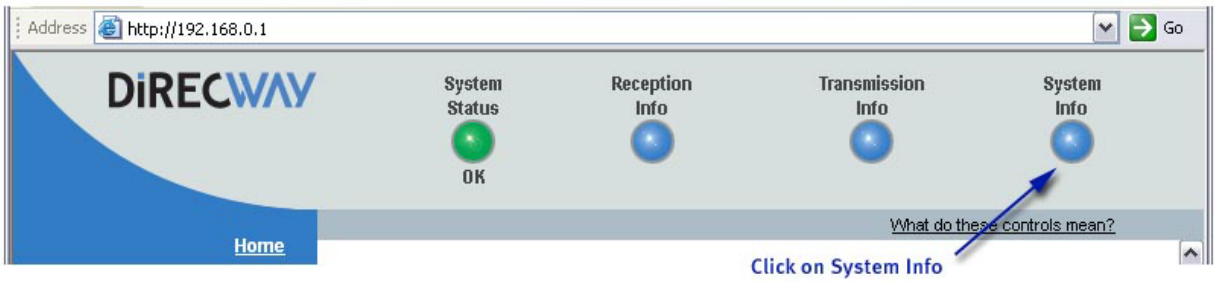
Signal Strength	58
Note: Signal Strength is not an indicator of browsing speed. Precipitation can affect Signal Strength. If you do not see a red flag next to any of the status messages on this page, you should be able to browse the Internet successfully.	
Transmit Status	Transmitter ready. (TxCode 8)
Receive Status	Receiver operational. (RxCode 5)
Software Download Status	All files are up-to-date.
Commission Status	Commissioned [Keys updated]
TCP Acceleration Status	Operational
Web Acceleration Status	Inactive

The DW6000 System Status screen will show any problems with the Direcway connection after the MAGELLAN has found and peaked on satellite.

TxCode 8 and RxCode 5 are "Working" Anything other code shows a problem.

Also, click on the hyperlinks of each of the listings for more information about what problem is happening.

SYSTEM INFO



Many times you will want to know the SITE ID and IRU Serial number to a DW6000 system… To do this, click on the "SYSTEM INFO" button on the Main DW6000 Administration screen. (URL - 192.168.0.1).

SITE ID - The Site ID is created upon commissioning the Direcway modem and represents the customer's active account on Direcway. The IRU is simply the serial number of the Direcway Modem.

This information is needed when you call Technical Support.

DW6000 Info

Site ID:	32112C01
SAN:	V3009958
Serial Number:	3281196
Software Creation Date:	Dec 7 2004, 13:42:17
Software Release Number:	4.3.0.9
IP Address:	192.168.0.1
Subnet Mask:	255.255.255.0
NAT IP Address:	67.143.135.77
NAT Subnet Mask:	255.255.255.255

Software Configuration

NAT:	Enabled
DHCP:	Enabled
Turbo Page:	Enabled

Satellite

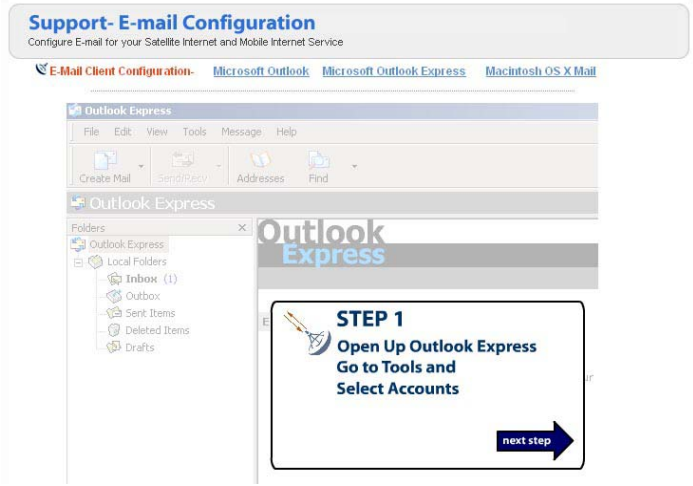
Transmit Path:	Satellite
Outroute:	Primary
Longitude:	99 West
Receive Frequency:	1350.0 MHz
Receive Symbol Rate:	30 Msps
Receive Polarization:	Vertical
Transmit Polarization:	Horizontal
22KHz Tone:	Off
Router Address:	66.82.25.159

The Site ID and Serial number can be found on this screen along with numerous other information. This screen is used often to help in troubleshooting the DW6000 connection.

HELPFUL HINT - Play around with the DW6000 Main Administration screens a while to get use to what information you have access to. The more you spend learning now, the better you will be on your next installation.

STEP 9 – CONFIGURING EMAIL ACCOUNTS

Now that you're online, you (or your customer) may access information on configuring email program.



Instructions for configuring you email accounts may be found at:

http://www.groundcontrol.com/support.htm

There are several FLASH programs that will easily guide you through this process.

STEP 10 – OPTIMIZE THE INTERNET CONNECTION

If you can… optimize all client computers connected to the MAGELLAN system to take advantage of web acceleration and other speed accelerators of Direcway. If you can't please make your customer aware of the LAN Client Utility (LCCU) from this link below.

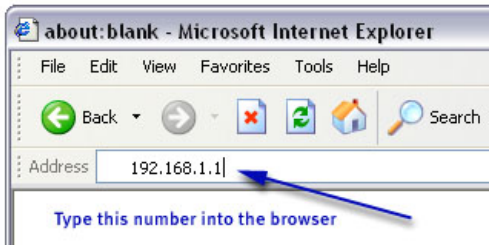
Please visit http://www.groundcontrol.com/supportdirecway.htm and download the LAN Client Configuration file. The manual for this program is also found on this page.

STEP 11 – CONFIGURE THE ROUTER/Wi-Fi ACCESS POINT

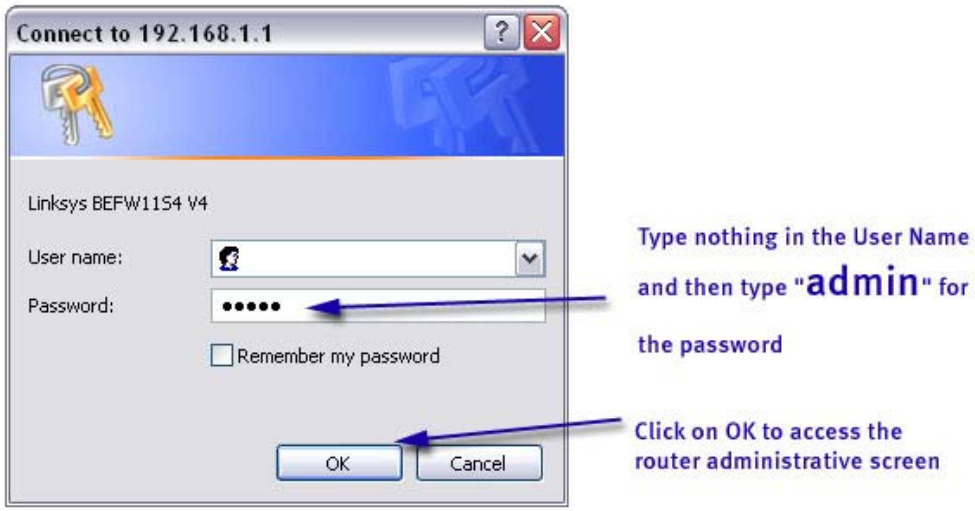
Now that the Direcway modems are commissioned, let's set up the Linksys router. The Linksys default setting is DHCP, which means it will assign any connected computer an IP address, which is the standard installation for a MAGELLAN system.

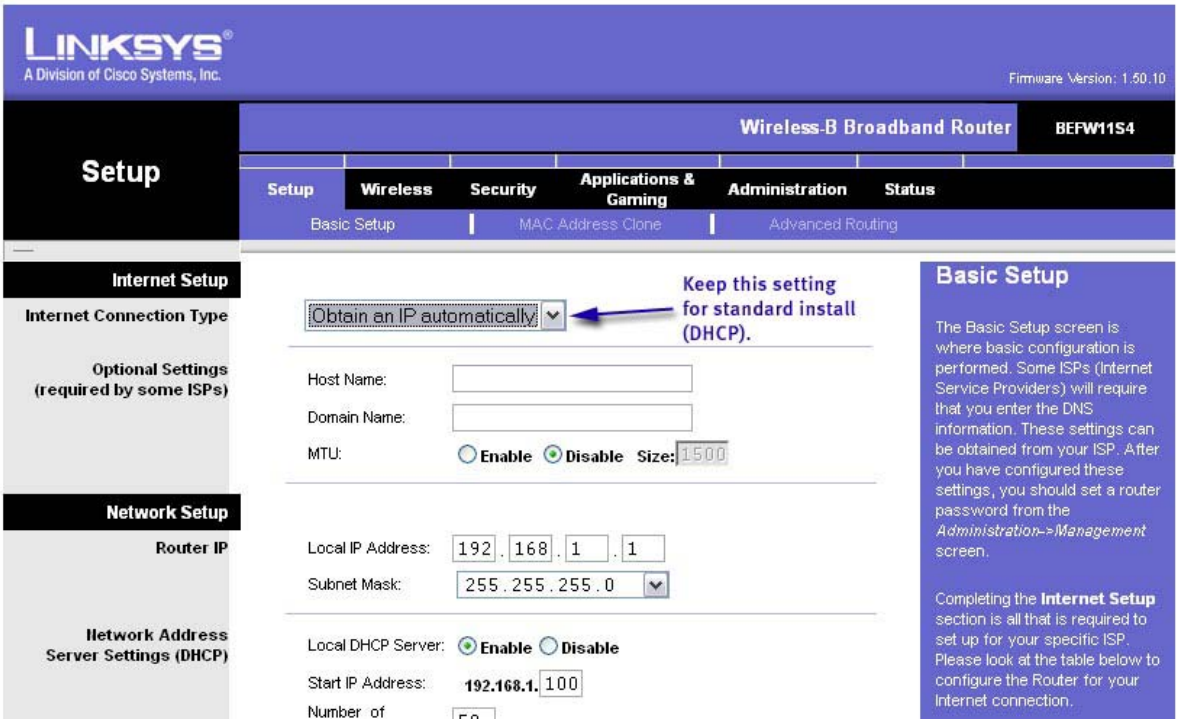
To start…Check to see that your computer is connected directly to the Router via an Ethernet cable.

Type in 192.168.1.1 in the browser window.



The password window to the router will appear:



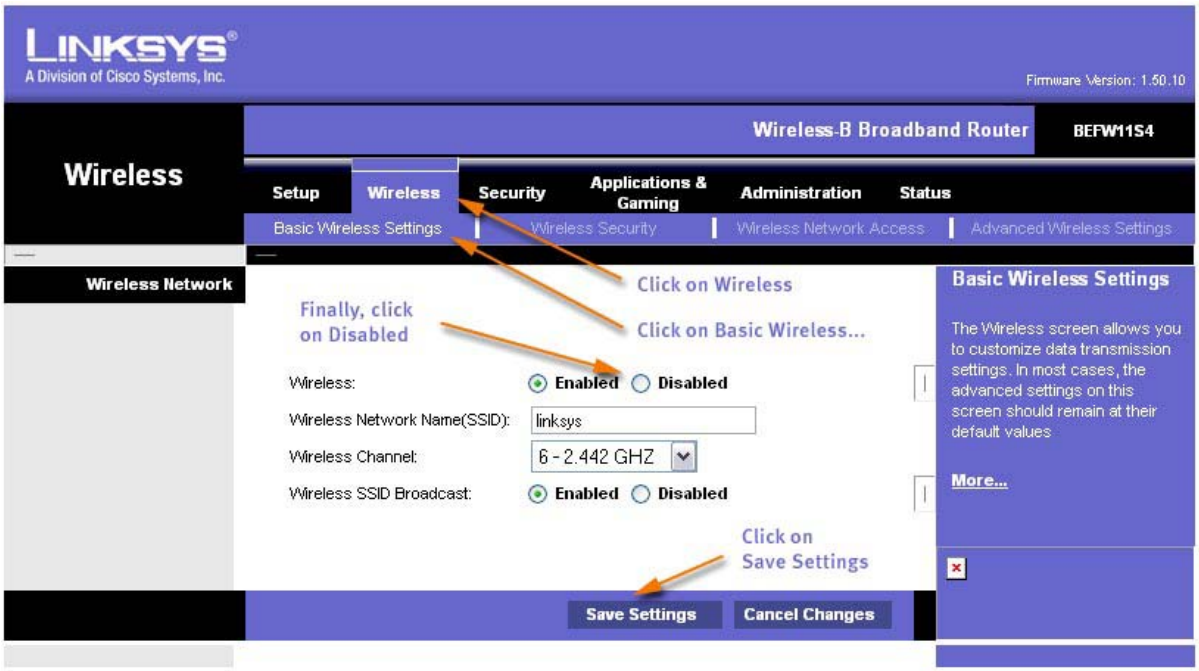

LINKSYS
A Division of Cisco Systems, Inc.
Firmware Version: 1.50.10
Wireless-B Broadband Router
BEFW11S4
Setup
Setup
Wireless
Security
Applications & Gaming
Administration
Status
Basic Setup
MAC Address Clone
Advanced Routing
Internet Setup
Internet Connection Type
Optional Settings (required by some ISPs)
Obtain an IP automatically
Keep this setting for standard install (DHCP).
Host Name:
Domain Name:
MTU:
Enable
Disable
Size:
1500
Network Setup
Router IP
Local IP Address:
192 . 168 . 1 . 1
Subnet Mask:
255.255.255.0
Network Address Server Settings (DHCP)
Local DHCP Server:
Enable
Disable
Start IP Address:
192.168.1.
100
Number of
Basic Setup
The Basic Setup screen is where basic configuration is performed. Some ISPs (Internet Service Providers) will require that you enter the DNS information. These settings can be obtained from your ISP. After you have configured these settings, you should set a router password from the Administration->Management screen.
Completing the Internet Setup section is all that is required to set up for your specific ISP. Please look at the table below to configure the Router for your Internet connection.

The router administrative screen defaults to the "Setup" menu option on the "Basic Setup" screen. There is no need to change anything on this screen if you are doing a standard DHCP install.

Make sure the "Local IP Address" is 192.168.1.1 (sometimes the router is not defaulted at this number).

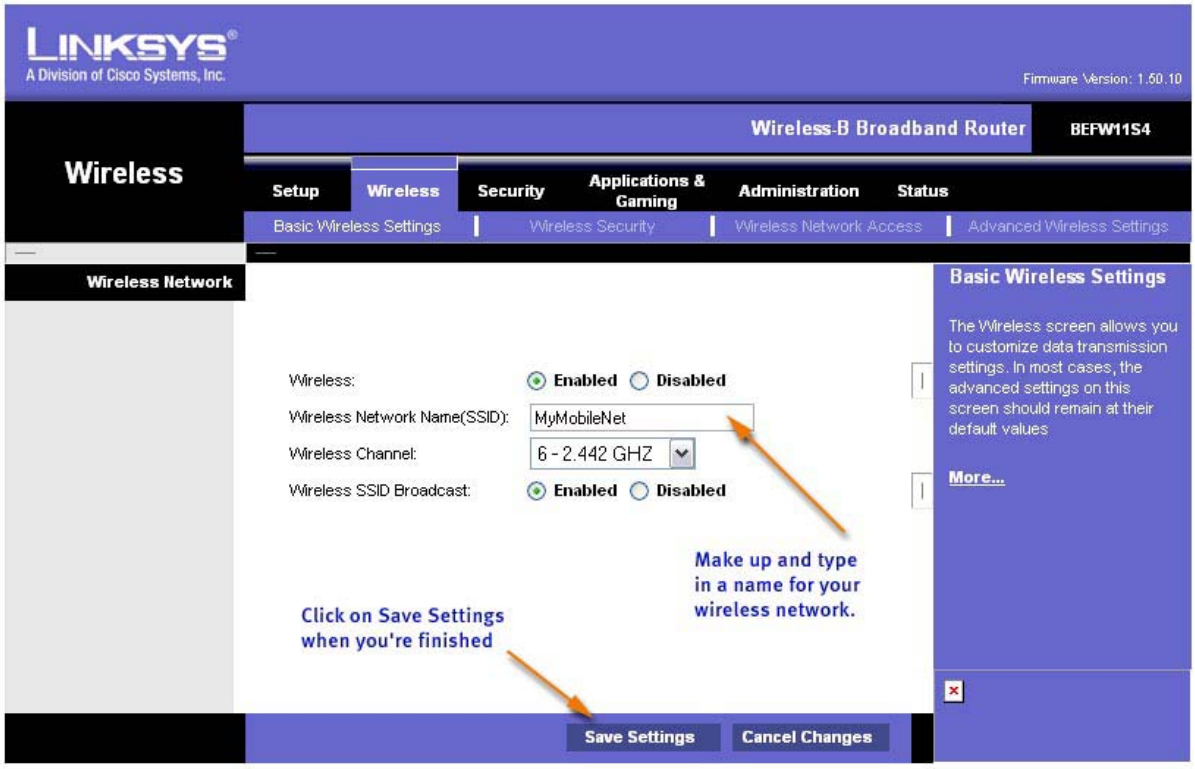
TURNING OFF WI-FI

Many customers will want the ability to create a Wi-Fi Hot-Spot for connecting their computer to the MAGELLAN system from anywhere inside (or outside) the vehicle. However, some customers may not wish to have this feature for security reasons. To turn it off, you simply need to access the screen below:



NAMING YOUR WI-FI CONNECTION

You will want to name your Wireless Access Point.

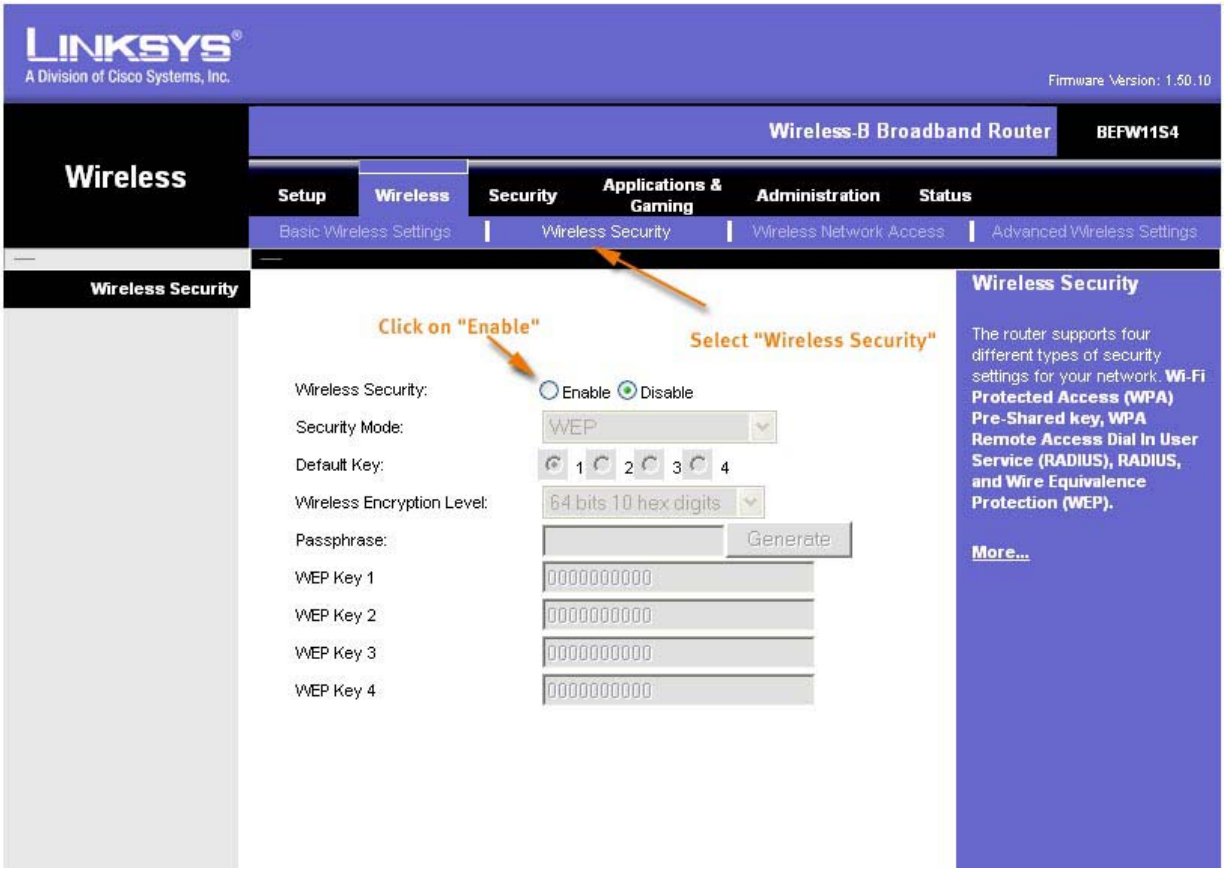


The name you choose for your access point will broadcasted and will be displayed to a client computer locating a wireless network to connect to.

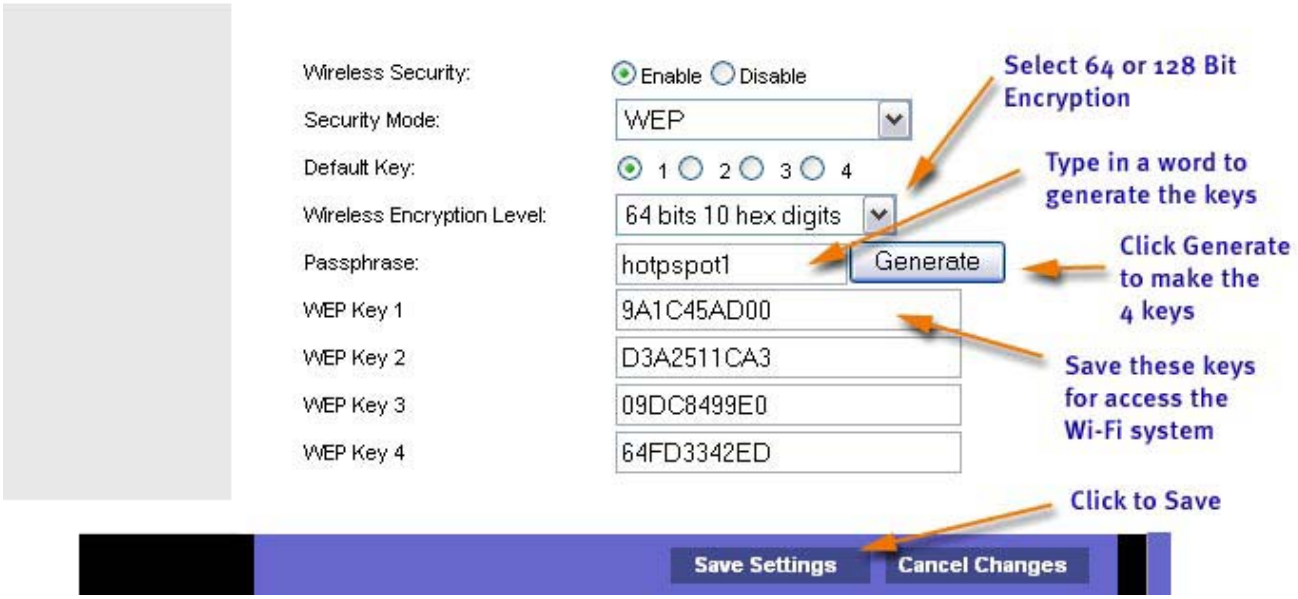
NOTE – You may choose one of eleven channels. The standard channel out of the box is 6. Use the pull down window to select a different channel. This action will not hide your network from view to those on different channels.

ENABLE SECURITY ON WI-FI

You have the option of password protecting the customer's Wi-Fi connection from being accessed by outsiders. If you do not set security on the Wi-Fi network, anyone may connect to it with ease. To set security, follow the screen below.



Once you've enabled security, you'll need to generate passwords:



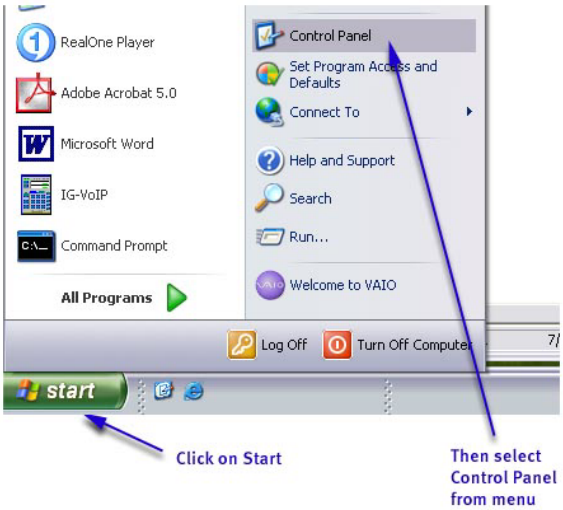
Write Down the Passwords for later use, or copy and paste them to a document or text file for cutting and pasting later. Remember, these passwords are only for those who want to connect to the Wi-Fi router. If you forget the passwords, you'll need to directly connect to the Wi-Fi router with an Ethernet cable.

CONNECTING TO THE WI-FI ACCESS POINT

Okay, so let's test to make sure the Wi-Fi network is working. You will need to have a wireless access card for your laptop or customer computer. There are only two kinds of retail Wi-Fi cards available, 802.11B and 802.11G…It does not matter which card you use, both will connect to the Linksys Wi-Fi access point.

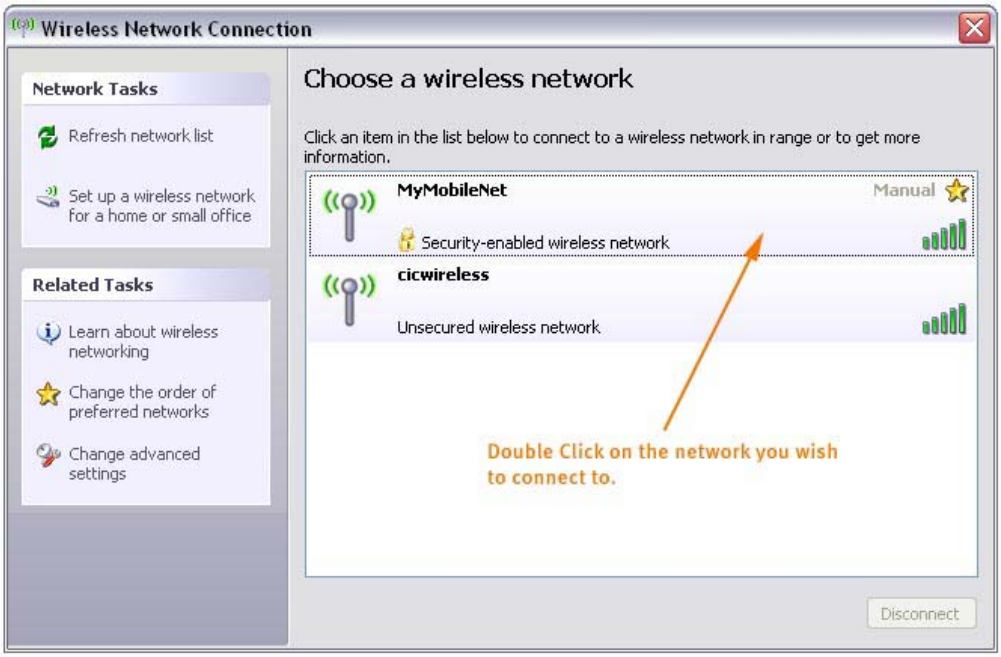
For this manual, we will assume that you will be using your laptop to connect. First you'll need to disconnect the Ethernet cable from the laptop to the Router and insert the Wi-Fi access card. Sometimes you'll need to reboot to clear out the network settings.

Now, let's access the available wireless networks by opening up the control panel…



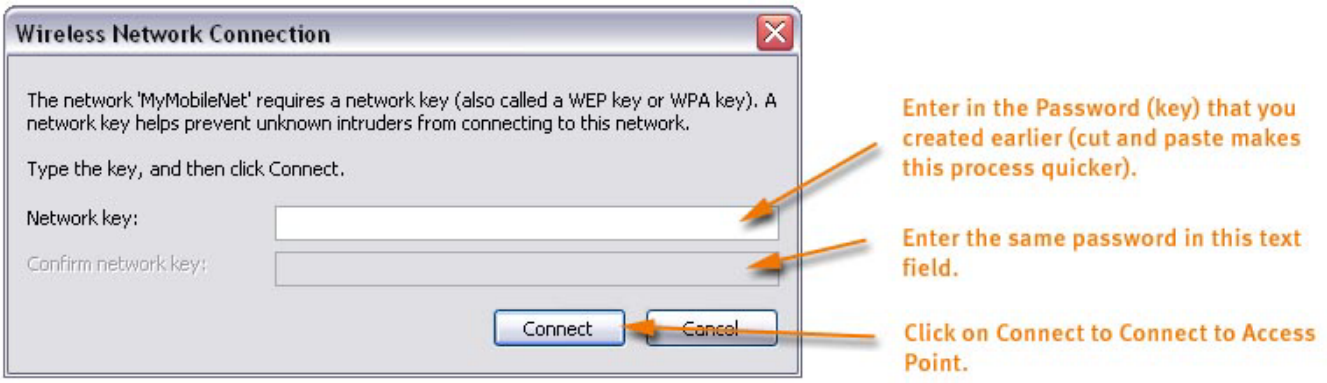
When the control panel appears… double click on "Network Connections".

The below screen will appear:

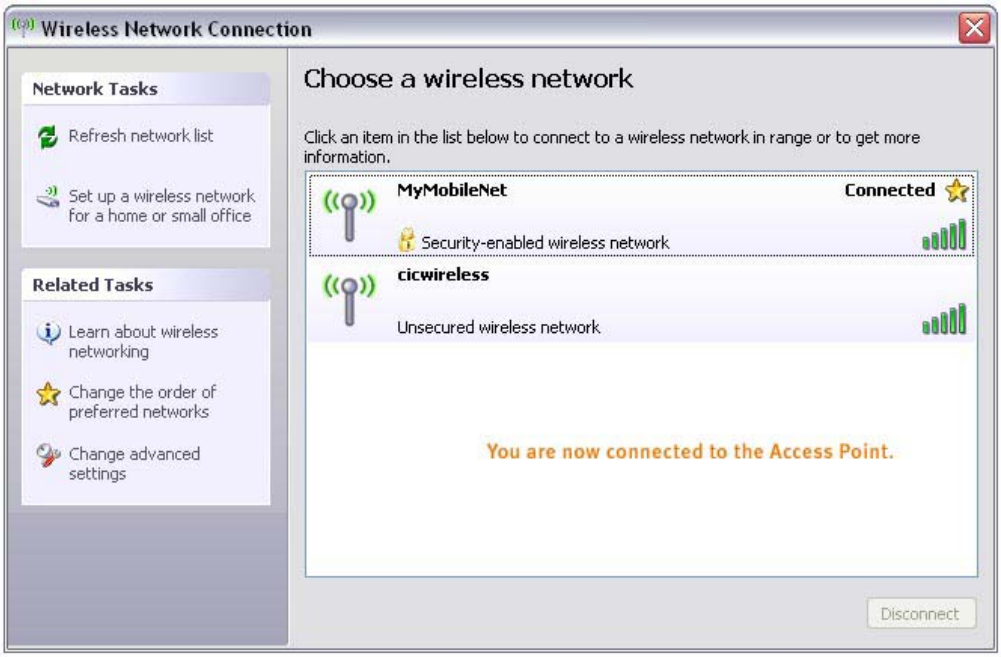

Wireless Network Connection
Network Tasks
Refresh network list
Set up a wireless network for a home or small office
Related Tasks
Learn about wireless networking
Change the order of preferred networks
Change advanced settings
Choose a wireless network
Click an item in the list below to connect to a wireless network in range or to get more information.
MyMobileNet
Manual
Security-enabled wireless network
cicwireless
Unsecured wireless network
Double Click on the network you wish to connect to.
Disconnect

The Wireless Network Connection screen will list ALL available Wi-Fi connections you may connect to. In this case, there are two networks to choose from. Notice that CICWIRELESS is Unsecured, and you may log into it without a password.

We named our Access Point "MyMobileNet" so this is the network you will connect to. Simply double click on the box to bring up a password screen seen below.


Wireless Network Connection
The network 'MyMobileNet' requires a network key (also called a WEP key or WPA key). A network key helps prevent unknown intruders from connecting to this network.
Type the key, and then click Connect.
Network key:
Confirm network key:
Connect
Cancel
Enter in the Password (key) that you created earlier (cut and paste makes this process quicker).
Enter the same password in this text field.
Click on Connect to Connect to Access Point.

If the access password is correct, you will be connected to the access point as shown below. Make sure that you type in the password which is CaSE SeNSiTiVe. We recommend that you cut and paste in the password and save it to a text file that you can email the customer.


Wireless Network Connection
Network Tasks
Refresh network list
Set up a wireless network for a home or small office
Related Tasks
Learn about wireless networking
Change the order of preferred networks
Change advanced settings
Choose a wireless network
Click an item in the list below to connect to a wireless network in range or to get more information.
MyMobileNet
Connected
Security-enabled wireless network
cicwireless
Unsecured wireless network
You are now connected to the Access Point.
Disconnect

Now if the Direcway dish is up and online, simply open a browser and start surfing the Internet. If you are not online, open up the Linksys Administrative window to see if you are able to access it. (192.168.1.1)… If you're getting router screen, the Wi-Fi connection from the computer to the access point is at least working.

NOTE - The next time your computer connects to this network, you password will be saved and you will automatically log in without having to type the password in again.

Troubleshooting – If you are having problems connecting to the Wi-Fi Network, please visit **Appendix C** – Troubleshooting your Wi-Fi connection.

STEP 12 – TEST THE REMOTE CONTROL PANEL

The Ground Control Remote allows a customer to simply click on the "Find Satellite" button and create a Wi-Fi Hot-Spot in minutes. This is the final test you need to perform to make sure the system is operating perfectly.

The remote behaves identically to the MAGELLAN Interface screen, and it has an additional button to turn remote power on and off.

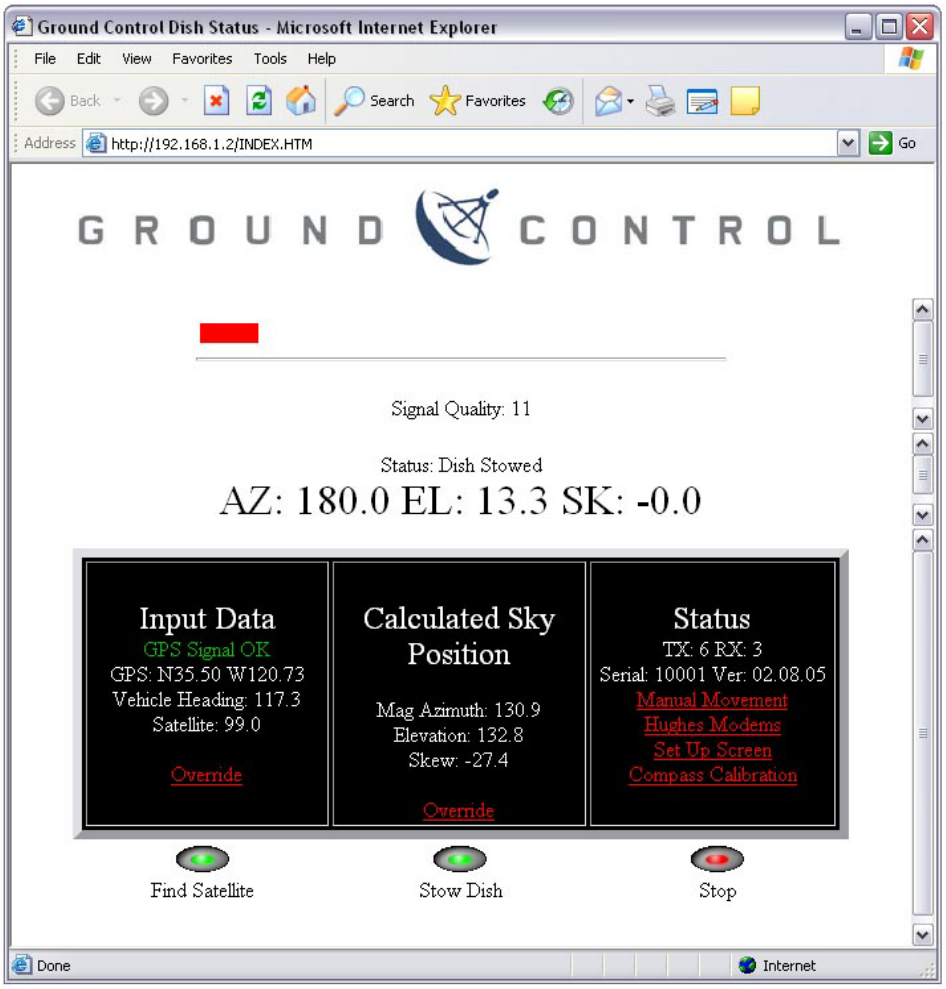
TURNING POWER ON – To turn power on from the remote, press the power button and the green light will appear in 1 or 2 seconds…Other lights will blink for anywhere from a few seconds to 80 or 90 seconds if the Direcway modems are booting up. When they stop, you may click on one of the other buttons.

There are 4 buttons… Power, Find Satellite, Stow Dish and Stop. When you think about it, these are all of the functions you need. Power to turn the system on… Find Satellite to locate the satellite from a stowed or raised position… And Stow Dish to… well, stow the dish. The Stop button will stop the dish from moving at any time.

The Status lights show the current state the dish is in.

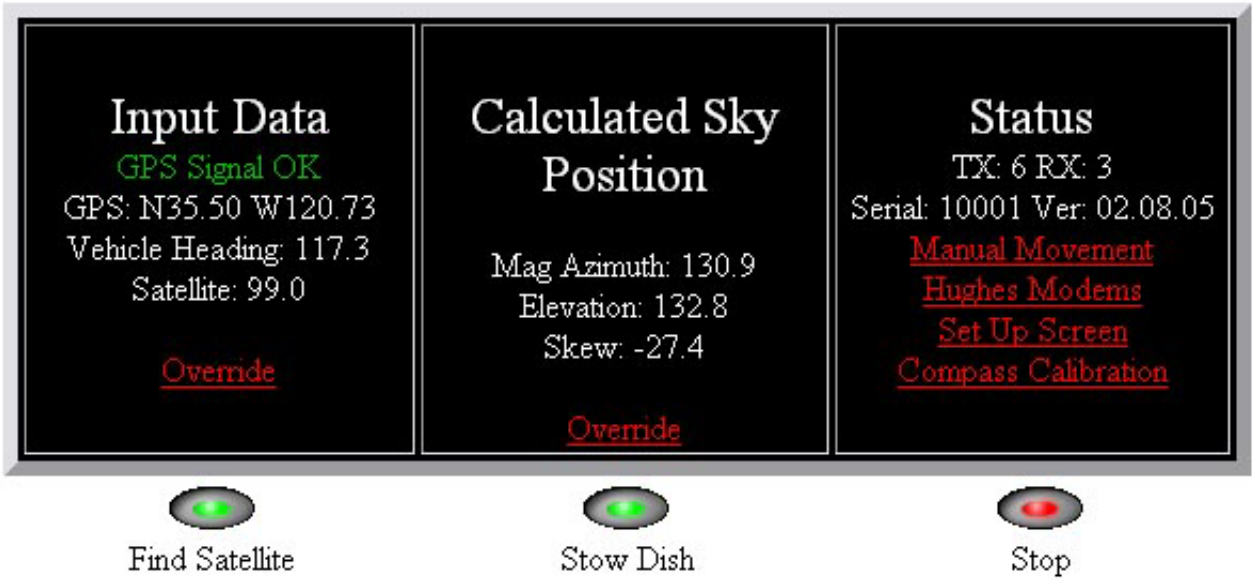
That's it! You've completed the MAGELLAN System Activation.

APPENDIX A – Explanation of the MAGELLAN Main Screen



BETA ADMIN SCREEN

The MAGELLAN Administrative panel may be reached from any connected computer by typing in 192.168.1.2 on any browser. On the above screen, the Direcway DW6000 modems shows a Signal Quality of 11 (11 is offline… 31 or higher is online and connected to the correct Direcway Satellite. If signal quality is less than 31, then the dish may be looking at a different satellite or nothing at all), the current Status of the dish (Stowed), and the angles of Azimuth, Elevation and Skew. Below is a closer look at the other screens.



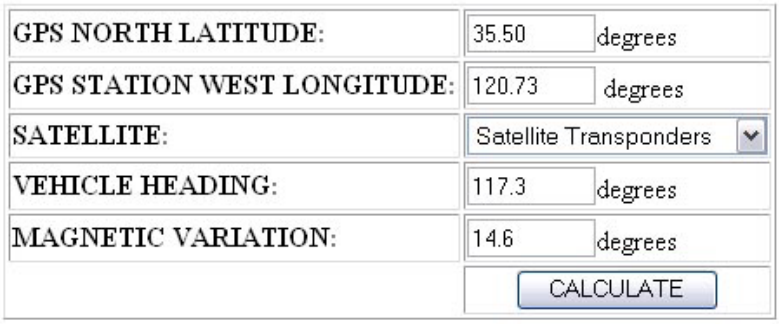
WINDOW - INPUT DATA

GPS – The Input Data window shows that GPS has been acquired. (The GPS Antenna is located inside of the Direcway Dish LNB cover at the end of the dish arm). It sometimes takes a minute for GPS to be read after the dish is booted.

Vehicle Heading – The magnetic direction the vehicle is headed. The screen above shows a magnetic heading of 117.3 degrees. This should be close to a handheld compass. If not, you will want to click on the "Compass Calibration" link on the bottom of the "Status" window seen above.

Satellite – This shows that your modems are set to acquire satellite 99 (99 degrees longitude, or satellite G11). DW6000 uncommissioned modems will show Satellite 99 as the default satellite. If you have a satellite reading of 0.0, then it means that your Direcway modems are not responding. You can check this by clicking on the "Hughes Modems" link on the Status Window. If the Hughes DW6000 administration screen does not appear, then check to see the modems are connected to the Linksys router and reboot the MAGELLAN by unplugging it from the power bar.

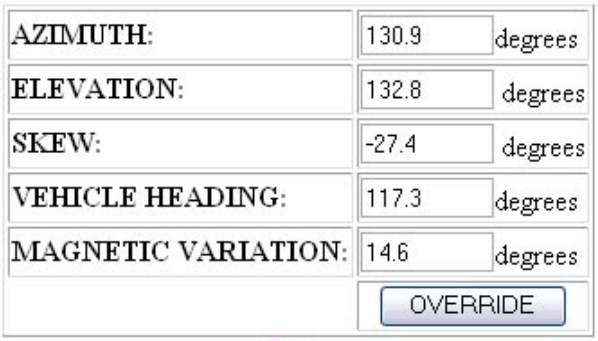
Override – Clicking on this link brings up the screen below.



You may manually override any of the selected options. For use in commissioning your modems, you will select your chosen satellite from the "Satellite Transponders" drop down box.

WINDOW - CALCULATED SKY POSITION

The center box on the MAGELLAN Administration screen shows the estimated location of the satellite based for Azimuth, Elevation and Skew. The only option is the Override link at the bottom that opens this window:



These override controls are not normally used in the commissioning of a MAGELLAN.

WINDOW - STATUS

The Status Window is a great resource to troubleshoot your system if problems occur.

TX:6 RX:3 – This is the actual status of the DW6000 modems.
For a list of what TX and RX stats codes means, visit APPENDIX B

Version – This shows the current flash programming the MAGELLAN is using. For instructions on upgrading your MAGELLAN to the most recent version, please visit Appendix E – Upgrading your MAGELLAN Flash Software.

Manual Movements – Clicking on this link will bring up the control panel that allows you to control the movement of the dish manually.

You may enter the number of degrees you wish to move any of the axis by typing in the number next to the "Step Size" on the axis you wish to move. Click on the arrows will move that axis the number of degrees entered.

Hughes Modems – This link takes you to the Direcway DW6000 Administrative screen.

Note how the DW6000 window on the same screen as the MAGELLAN Interface Screen. You may bring up the DW6000 screen on a different browser window. Simply type in 192.168.0.1 to access this screen.

INSTALLER TRICK
Add these links to your browsers "FAVORITES" Menu so you an easily access these screen with a simple hyperlink in your favorites list.

* 192.168.1.1 - Linksys Router Administrative Screen
* 192.168.1.2 - MAGELLAN Administrative Screen
* 192.168.0.1 - Direcway Main Administrative Screen
  192.168.0.1/fs/registration/setup.html – Direcway Setup Screen… Used in commissioning
  192.168.0.1/fs/advanced/advanced.html - Advanced DW6000 Admin Screen

It is a good idea to add the links marked by a red * to your customers computer as well so they can troubleshoot future problems if they occur.

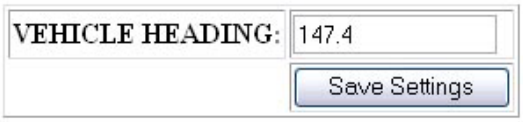
Setup Screen – This link shows default settings for your DW6000 system.

DISH CONTROL IP ADDRESS:	192.168.1.2
DISH CONTROL SUBNET MASK:	255.255.255.0
HUGHES MODEM IP ADDRESS:	192.168.0.1
DEFAULT GATEWAY ADDRESS:	192.168.1.1
DNS SERVER ADDRESS:	192.168.1.1
	Save Settings

You may need to make changes to this screen if your customer has a Static IP address.

Compass Calibration – This link brings up the below screen and is used to calibrate the MAGELLAN compass. You have the option of entering in your handheld compass reading (for the direction the vehicle is headed) or if your dish is online, you may just press on the "Online Compass Calibration". Having found the satellite, the Dish knows the direction your vehicle is headed (if the dish has been installed correctly on the roof, and not sideways or backwards).

You do not need to move the rig in order to calibrate the compass. Also, the compass will learn over time to become more accurate.



When you save this setting, the dish will perform a compass calibration, which will move the dish and take couple of minutes. The dish will not stow after it performs a calibration.

APPENDIX B – Direcway RX & TX Error Codes

LIST OF DIRECWAY TX (Transmit) and RX (Receive) CODES

Transmit Error Codes

Numeric TxCodes	Message Displayed	Comments
0	The Transmitter is not connected to the receiver	This is an older code for a DW4000 or DW4020 system.
1	The transmitter has been disabled by the Network Operations Center	This condition occurs when the transmitter is not enabled. A transmitter may be disabled for short periods of time by the NOC for service or troubleshooting. It may also be disabled if the user discontinues the satellite service. If this condition persists, it can only be corrected by requesting that the unit be enabled.
2	The transmitter has been placed in test mode by the Network Operations Center	This status requires no user action and this test usually completes in 15 minutes or less. This condition occurs when the NOC places the transmitter into special transmission modes to measure the performance of the transmitter. When in this mode, the unit is unable to transmit normal user data to the NOC.
3	The transmitter is locking to the receive carrier	This condition occurs during initial startup or when the receiver is locking to the receive signal. It is normal for this condition to persist for up to 10 seconds. If this condition persists for more than 10 seconds, try disconnecting and reconnecting the receiver coaxial cable and wait 10 seconds. If the situation still persists, then the Indoor Transmit Unit may need to be replaced.
4	The transmitter is not responding to commands sent from the receiver	This condition indicates that something is not operating properly in the Receive/Transmit Unit configuration. Perform the following actions to attempt to recover from this condition: • Verify that the Indoor Receive and Transmit Units are securely connected with a 25-pin parallel cable. • Reset the IRU by unplugging the IRU power cord from the wall socket and then plugging the power cord back into the wall socket. This will reset the Indoor Receive and Transmit Units. This condition could also be caused if the power supply is faulty. If this condition cannot be resolved by following the steps listed above, then you may need to replace the power supply, the Receive/Transmit unit cable and/or the Transmit Unit.
5	The transmitter is not locked to the network timing	No action is necessary if this condition occurs from time to time and quickly resolves itself. If this issue persists, it is likely due to a NOC-related service issue. The condition may also be due to Indoor Transmit Unit failure; in rare cases, the Transmit unit may fail and may have to be replaced.
6	The transmitter is not available because the receiver is not detecting a signal or is not locked to the correct network	Check your receive signal. This condition occurs when the Indoor Receive Unit is not receiving a good signal. The receiver must be locked to the correct network in order for the transmitter to operate. If your receiver is not locked (no signal) or is locked to the wrong network, the transmitter is unable to transmit data. Please verify that you have a good signal strength by going to the Receive Statistics page. This could also be caused by inclement weather.
7	The transmitter is not available because the satellite receiver is not tuned for normal	This condition occurs when the transmitter is disabled for safety reasons. If this happens during installation or commissioning, the installer will close the Antenna Pointing program and resolve the condition.

	operation	
8	The transmitter is available	This is the normal operational state and indicates that the transmitter is ready to transmit data.
9	The transmitter is adjusting for optimal network timing	This condition typically occurs when your DW4020 is first commissioned or the first time it is used for data traffic. This must occur before the Indoor Transmit Unit is able to transmit successfully. Typically, this process usually takes less than a minute.
10	The transmitter is unable to communicate with the Network Operations Center	This condition indicates that the unit has stopped attempting to transmit user data because there were a number of failures in sending data to the NOC over the satellite link. This could be the result of weather conditions causing lost packets or return channel equipment failures in the NOC.
11	The transmitter is not available because the receiver software is out of date	This condition indicates that the installed software version is not recent enough to operate on the network. New software will be required from time to time due to network infrastructure and capability upgrades and in order to maintain network efficiency and fix any known problems. The system will automatically update your software version to ensure that you can enjoy uninterrupted operation. If you do not use the DW4020 for a long period of time and miss the updates, you may need to contact Customer Care.
12	The transmitter is not receiving network control messages from the Network Operations Center	This condition indicates a NOC equipment outage. This may be a transient condition and the system should recover automatically.
13	The transmitter is unable to range because it cannot communicate with the Network Operations Center	Ranging is the process that adjusts your satellite transmitter timing and power. Your satellite transmitter conducts ranging as needed to ensure that it can communicate successfully with the Network Operations Center. This condition can indicate any of the following: • The NOC is not receiving ranging information from the transmitter. This may indicate a transmit problem at the NOC. This should get cleared in a few minutes. • The transmitter is unable to achieve enough transmit power to send ranging information to the NOC. Make sure that the power supply is correct. The power supply should be Part #1031105-0001. • The transmitter is sending incorrect timing data because the wrong zip code or latitude/longitude information was entered during installation. • The outdoor transmitter unit (ODU)--that is, the antenna--is not operating properly or is not properly connected to the ITU. Please ensure that the transmit cable is securely fastened to the Transmit Unit.
14	The transmitter is not available because ranging has failed	This condition indicates that the transmitter is not operational because ranging has failed. Ranging is the process that adjusts your satellite transmitter timing and power. Your satellite transmitter conducts ranging as needed to ensure that it can communicate successfully with the Network Operations Center. The ranging failure may happen due to the antenna becoming misaligned or if repeated attempts to range do not succeed. This condition may also be caused due to adverse weather conditions. In rare cases, this may also indicate NOC issues but should clear within a few minutes. If your system was operational in the past and you see these messages repeatedly, you can try to force range by performing the Connectivity Test.
15	The transmitter is waiting for a ranging request to be processed by the Network Operations Center	This condition occurs if the system is busy adjusting power and timing for other users. This process may take up to a minute or more.
16	The transmitter is waiting for a transmit request to be processed by the Network Operations Center	This condition occurs when the system is unable to provide transmit bandwidth. This occurs when many users sign-on simultaneously. It should clear in a few minutes automatically.
17	The satellite transmitter is unable to obtain an available transmission rate	This condition occurs if the transmitter cannot successfully range. Ranging is the process that adjusts your satellite transmitter timing and power. Your satellite transmitter conducts ranging as needed to ensure that it can communicate successfully with the Network Operation Center. A possible cause is that the transmitter could not achieve enough power to transmit. This is likely caused because the antenna is not accurately pointed. However, it may also be a transmitter power problem. Check the power supply and make sure that it is Part # 1031105-0001.
18	The transmitter is requesting a	This condition can occur during installation when the Antenna Pointing

	transmit pointing test	program on the installation computer requests that the transmitter perform a transmit pointing test. This condition persists until the NOC responds that the transmitter is either actively performing the pointing test or is queued to perform the test when test resources become available in the NOC. This is a normal condition for initial installation. The transmitter may also periodically go into this condition for short periods of time (less than 5 seconds) to perform periodic transmit pointing tests. These periodic tests are performed to ensure that the antenna is pointed accurately.
19	The transmitter is queued for a transmit pointing test	This condition can occur during installation when the Antenna Pointing software on the installation computer requests a transmit pointing test and the NOC has responded that the transmitter is queued for the next available test time. It may also occur when the transmitter is performing periodic background transmit pointing tests at the same time that other users on the network have requested tests. This is a normal state after initial installation.
20	The transmitter is performing a transmit pointing test	This condition occurs when one of the following tests are active: • During installation, the Antenna Pointing software requests that the transmitter perform a transmit pointing test. This condition will persist until the Antenna Pointing software exits from the transmit pointing test mode. • The DW4020 performs a periodic background transmit pointing test to make sure that the antenna is still pointed correctly. This periodic test takes less than 5 seconds. If the problem persists, try power-cycling the DW4020 by unplugging the wall outlet and plugging it back in.
21	The transmitter is disabled because a transmit pointing test failed	This condition occurs when the transmitter fails a transmit pointing test. This indicates that the transmitter did not meet the minimum specifications required. This is likely due to an antenna installation problem. The antenna installer needs to fine-point the antenna. The transmitter will not transmit until the transmit pointing test passes.
22	The transmitter is disabled pending a transmit pointing test	This condition occurs when the transmitter is required to perform a periodic background transmit pointing test, but has not been able to perform the test within the time window required. The transmitter is expected to be in this condition for no more than two minutes at random periodic intervals. This condition can also occur after the transmitter is first powered on after it has been powered off for more than a day. If the unit remains in this condition for more than two minutes, then the automated transmit pointing components in the NOC are likely experiencing problems. This condition should clear in a few minutes.
23	The transmitter is disabled because a transmit pointing test cannot be performed	This condition occurs when the transmitter cannot perform the transmit pointing test when initially installed or when the transmitter is required to range. The condition indicates that the NOC components needed to perform the transmit pointing test are not operational.

RECEIVER ERROR CODES

Numeric RxCode	Message Displayed	Comments
0	The receiver is not connected	Please make sure that the Indoor Receive Unit is connected to the Gateway via the USB cable. If the cable is connected and you still see this message, use the following steps for troubleshooting: • Make sure the power supply is correct. The power supply should be Part # 1031105-0001. • Try power-cycling the DW4020 by unplugging the power cord from the wall outlet and then plugging it back in. • Try using a different USB cable. • If none of the above resolve the issue, you may need to replace the Indoor Receive Unit.
1	The receiver is in pointing mode	mode This condition indicates that the installer is performing antenna pointing. In this mode, the transmitter is disabled for safety reasons since the installer is working near the dish. If this occurs during normal operation, try power-cycling the DW4020 by unplugging the power cord from the wall outlet and then plugging it back in.
2	The receiver is in factory or NOC mode	This status is for DW4020 testing purposes only. You should never see it. If this occurs during normal operation, try power-cycling the DW4020 by unplugging the power cord from the wall outlet and then plugging it back in.
3	The receiver is not locked to a signal	If the DW4020 had been operating previously, this status is probably due to inclement weather conditions and will be corrected when the weather

		improves. This condition can also indicate that the IRU is unable to receive the signal from the NOC. This is also associated with a signal level less than 30. This occurs if there is a weather outage at the user location, a NOC outage due to inclement weather or other reasons, a misaligned or faulty antenna, or faulty cabling. If this keeps happening under normal weather conditions, make sure the power supply is correct. The power supply should be Part # 1031105-0001. If the power supply is correct, try power-cycling the DW4020 by unplugging the power cord from the wall outlet and then plugging it back in.
4	The receiver is locked to the wrong network	This condition should only be seen during installation and occurs when the receiver is locked to a signal, but the signal ID does not match the ID that was assigned to the user during commissioning or the ID that was entered by the installer during manual pointing. If this occurs during normal operation, it may be due to the user changing acquisition parameters, including frequency and/or location of satellite, or the antenna becoming misaligned.
5	The receiver is operational	This is the normal operating state where the receiver is receiving data from the NOC. Only when the receiver is in this state will the transmitter operate correctly.
6	The receiver is not detecting a signal	This condition occurs when the IRU is not detecting any type of radio signal from the antenna. This could indicate that the cabling between the receiver and the antenna is faulty or that the receiver itself is faulty. Check that the cables are firmly connected on the DW4020. Also, make sure that the power supply is correct. The power supply should be Part # 1031105-0001. Try power-cycling the DW4020 by unplugging the power cord from the wall outlet and then plugging it back in.
7	The receiver is locked to an unknown network	This condition should only be seen during installation and occurs when the receiver is locked to a signal but there is no DIRECWAY Network ID on that signal. If this occurs during pointing or commissioning, the antenna has not been pointed correctly. If it occurs during normal operation, it may be due to the user changing acquisition parameters, including frequency and/or location of satellite, or the antenna becoming misaligned. The former condition can be corrected by re-commissioning the site. The latter requires an antenna re-pointing.

APPENDIX C – TROUBLESHOOTING YOUR WI-FI CONNECTION

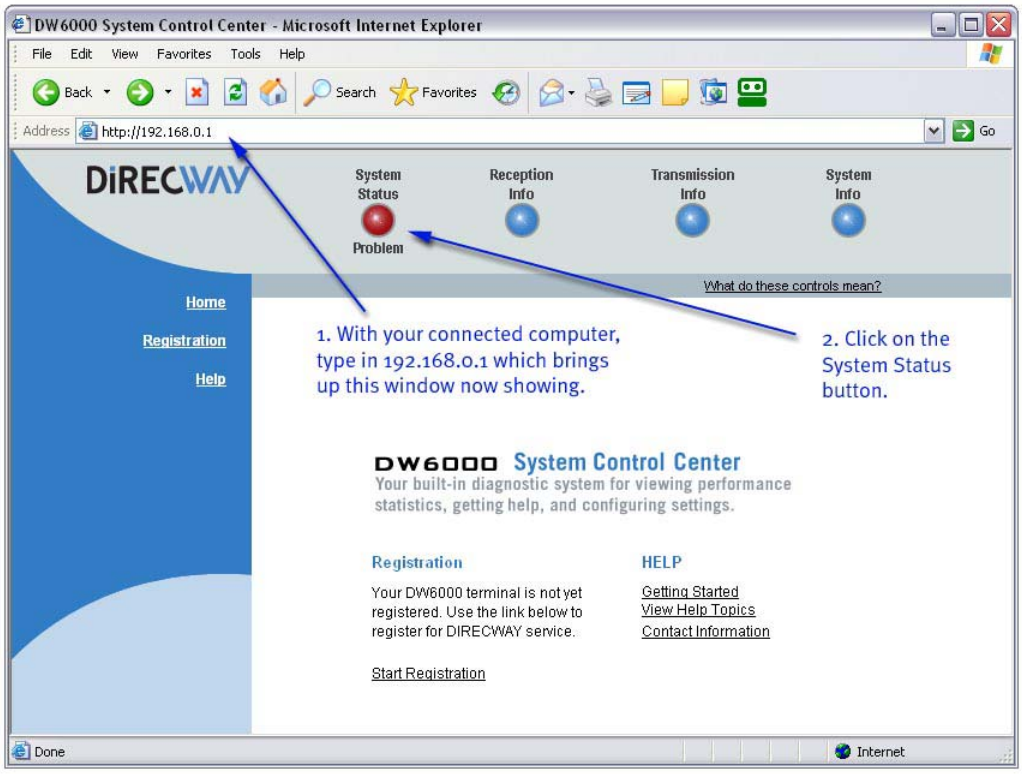
Ground Control Technical Support is available 24-7 at 805-542-0688 or by email at support@groundcontrol.com

APPENDIX D – PERFORMING A CROSS POL MANUALLY

“Cross Pol” or “Automated Cross Pol” (ACP for short) is the process of aligning the skew of the dish face to be aligned with the orbiting satellite. Why? Because a satellite dish can transmit in both horizontally or vertically waves. These waves must be aligned perfectly with the horizontal and vertical axis of the orbiting satellite, or transmission is impossible.

To make the whole process of aligning skew easier, the DW6000 modems have an automated cross pol routine that will tell you how well your dish is skewed real-time when it is pointed at the correct satellite. Obviously, the MAGELLAN will do all of this automatically, but as an installer, you should know how to perform a cross pol manually for any reason.

Okay… Making sure your computer is connected to the router, type in 192.168.0.1 to bring up the Main Direcway Status Screen

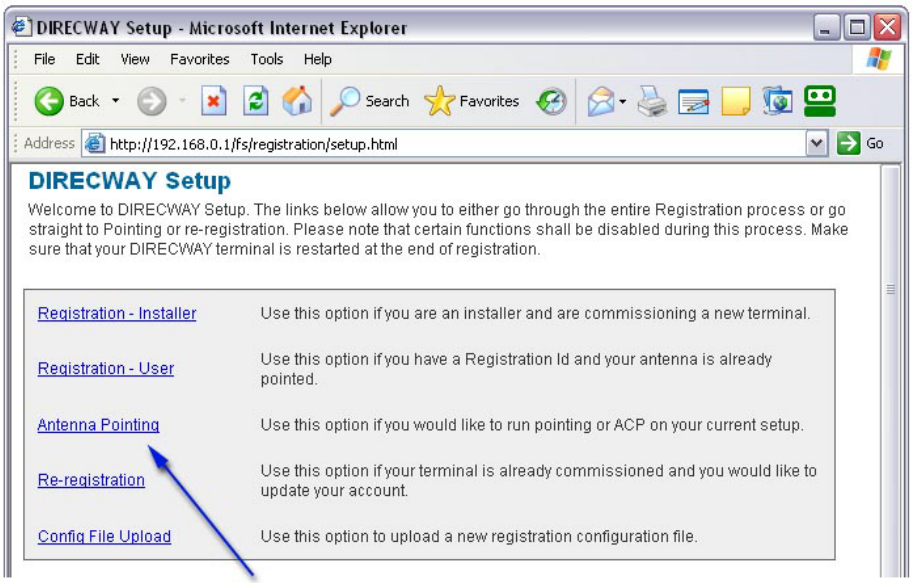


Click on "System Status"… The below screen will appear:

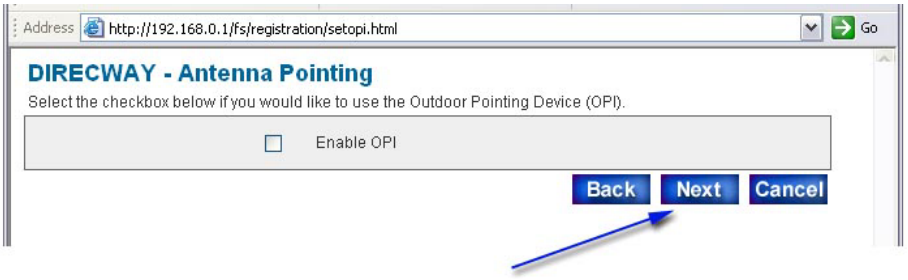
Signal Strength	50
Note: Signal Strength is not an indicator of browsing speed. Precipitation can affect Signal Strength. If you do not see a red flag next to any of the status messages on this page, you should be able to browse the Internet successfully.	
Transmit Status	Transmitter unavailable due to receiver tuning problem. (TxCode 7)
Receive Status	Receiver operational. (RxCode 5)
Software Download Status	Waiting for first heartbeat message.
Commission Status	Not Commissioned [No keys]
TCP Acceleration Status	Disabled

On this screen, signal strength is 50, which means we are on the correct satellite. (Anything over 31 is on the correct satellite). If you are curious as to what TX Codes 7 and RX Codes 5 are, please review APPENDIX B. Note that this screen shows an uncommissioned set of modems. You may pass cross pol with an uncommissioned set of modems as easily as a commissioned set of modems.

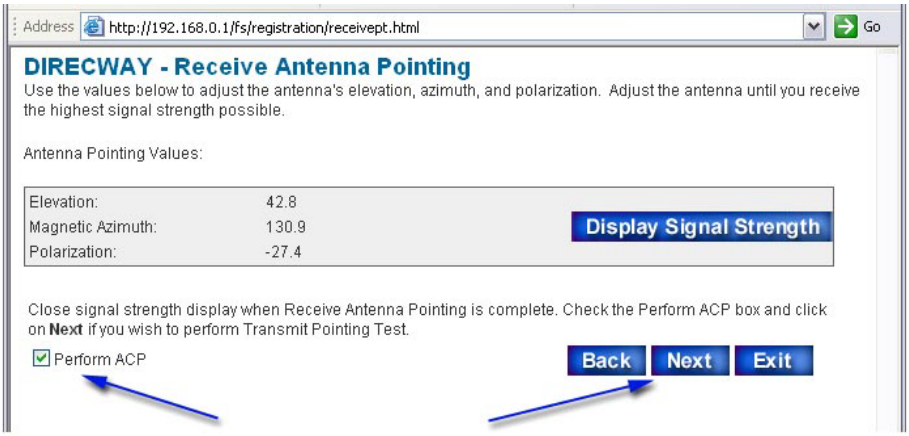
Now bring up another Browser window and type in:
http://192.168.0.1/fs/registration/setup.html
The window below will appear:


DIRECWAY Setup - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://192.168.0.1/fs/registration/setup.html
Go
DIRECWAY Setup
Welcome to DIRECWAY Setup. The links below allow you to either go through the entire Registration process or go straight to Pointing or re-registration. Please note that certain functions shall be disabled during this process. Make sure that your DIRECWAY terminal is restarted at the end of registration.
Registration - Installer
Use this option if you are an installer and are commissioning a new terminal.
Registration - User
Use this option if you have a Registration Id and your antenna is already pointed.
Antenna Pointing
Use this option if you would like to run pointing or ACP on your current setup.
Re-registration
Use this option if your terminal is already commissioned and you would like to update your account.
Config File Upload
Use this option to upload a new registration configuration file.

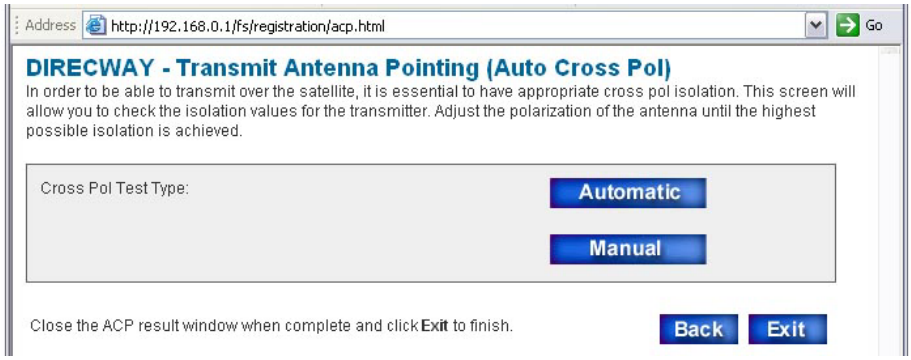
Click on “Antenna Pointing”, to advance to the next screen:



Click on “Next” to bring up the screen below (there is no need to check OPI).


Address http://192.168.0.1/fs/registration/receivept.html
Go
DIRECWAY - Receive Antenna Pointing
Use the values below to adjust the antenna's elevation, azimuth, and polarization. Adjust the antenna until you receive the highest signal strength possible.
Antenna Pointing Values:
Elevation: 42.8
Magnetic Azimuth: 130.9
Polarization: -27.4
Display Signal Strength
Close signal strength display when Receive Antenna Pointing is complete. Check the Perform ACP box and click on Next if you wish to perform Transmit Pointing Test.
Perform ACP
Back
Next
Exit

Click on “Perform ACP”, and then click on “Next”.


Address
http://192.168.0.1/fs/registration/acp.html
Go
DIRECWAY - Transmit Antenna Pointing (Auto Cross Pol)
In order to be able to transmit over the satellite, it is essential to have appropriate cross pol isolation. This screen will allow you to check the isolation values for the transmitter. Adjust the polarization of the antenna until the highest possible isolation is achieved.
Cross Pol Test Type:
Automatic
Manual
Close the ACP result window when complete and click Exit to finish.
Back
Exit

This is the main ACP window that allows you to do 2 different kinds of Cross Pol Routines.

AUTOMATIC – This test is PASS or FAIL. If you pass, you are fully cross poled and if your modem is commissioned, you may start surfing on the internet (normally in 10 to 20 seconds). You may run this test as often as you like. You only need to PASS once to be successful, but the dish will not pass if it is not skewed properely.

MANUAL – This is a real time meter that shows you how well your dish is skewed from moment to moment (this is called the "isolation" reading). If you move the dish skew, the isolation meter will raise or lower depending on how well the dish is skewed (higher numbers are better). This meter allows you to make fine adjustments to the skew. The test will run for about 1 to 2 minutes before it will automatically shut down… at which point, you may click on the MANUAL button to restart the test again.

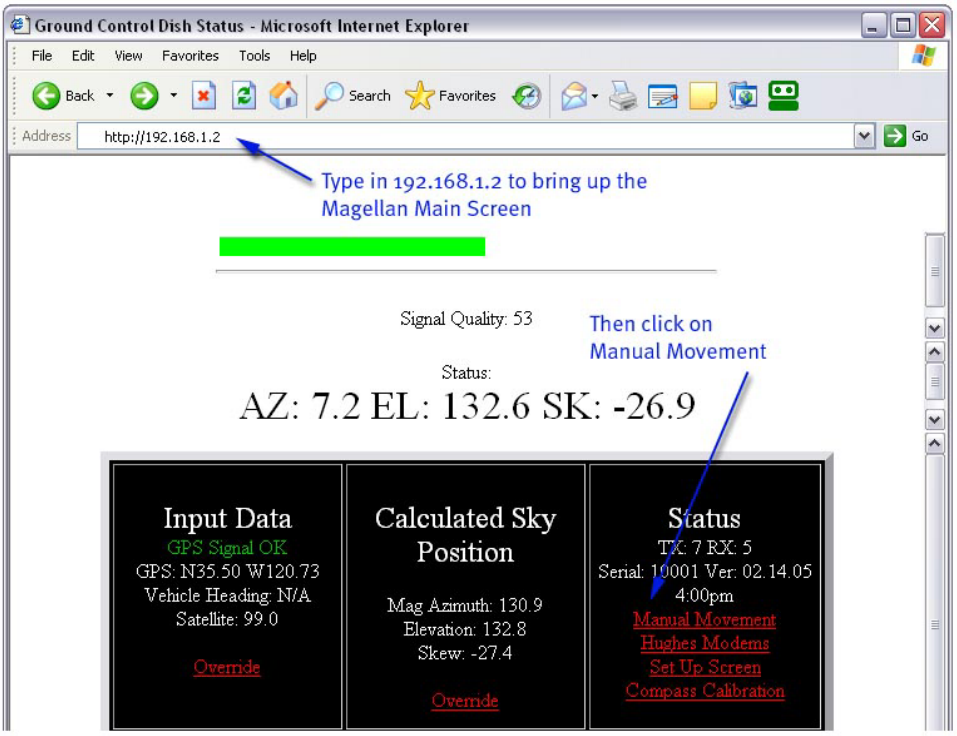
THINGS TO KNOW ABOUT ACP.

- During busy usage of the ACP server, you will request a manual test and there will a MANUAL test may show a queue of people waiting to take the test. It may take seconds or minutes for your turn to take place.

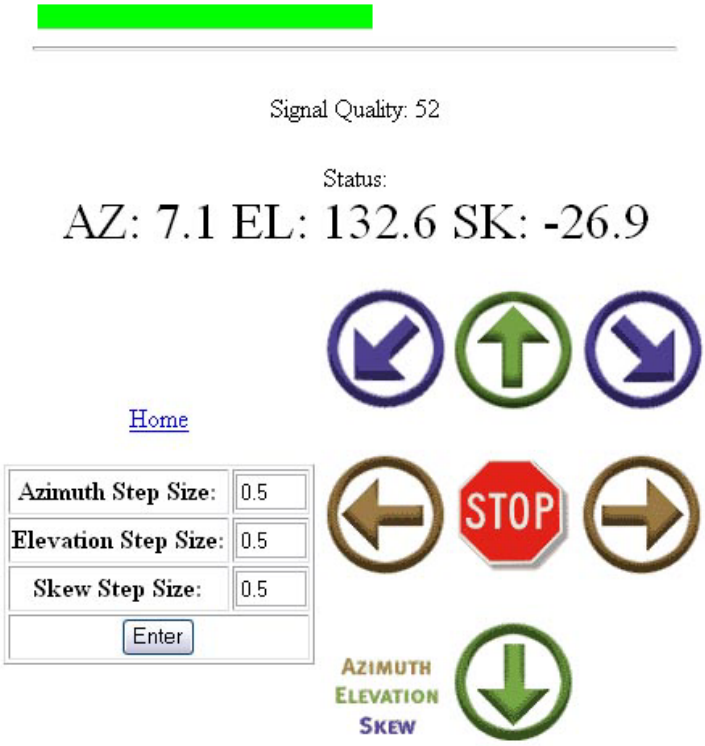
- The Manual test will not pass you in ACP. You must successfully pass on AUTOMATIC test to successfully pass cross pol.

USING A MOBILE SATELLITE DISH
Obviously, the mobile dish would have calculated a skew already when it found the satellite, and you may want to skip the Manual test and see if you can get a passing grade with the Automatic Test. If not, you'll have to use the manual motor controls. If you have a NON-commissioned Direcway modem, the MAGELLAN will only pass on G4R automatically. You do have the option of using the MAGELLAN to find a different satellite, and then performing a Cross Pol (for commissioning) on that satellite.

If you don't pass with Automatic, we'll have to tweak the satellite dish skew. To do this, type in 192.168.1.2 to bring up the Ground Control MAGELLAN Main Screen:



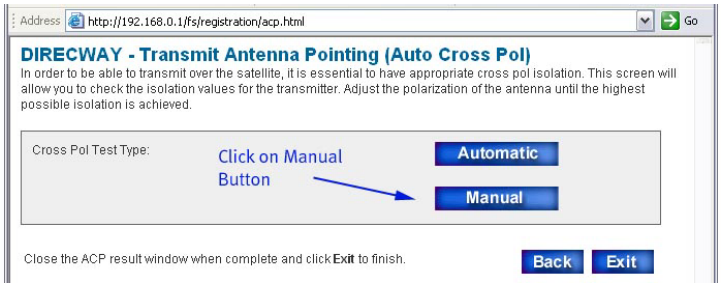
Clicking on Manual Movements will make the screen below appear:



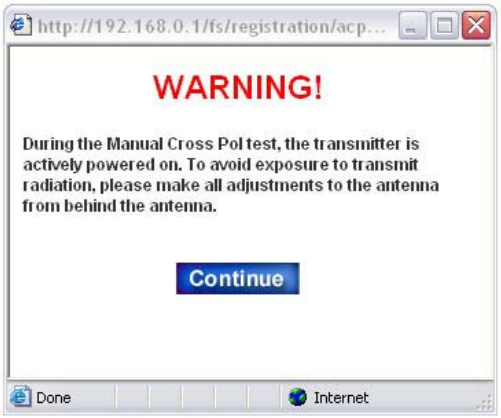
The blue buttons (top right and top left, pointing diagonally down) allow you to rotate skew one direction or the other. The Signal Quality Meter will change to an Isolation meter when you run the MANUAL test. Note that the Skew Step size is .5 degrees, which is fine for now… You may wish to enter 0.2 degrees for even finer control of the skew rotation.

When you move skew, the angle of the skew will change. The Skew angle is shown as "SK: -26.9" degrees on the graphic above.

Okay… now bring up the Pointing Test browser window again (as seen below). Click on the Manual button.

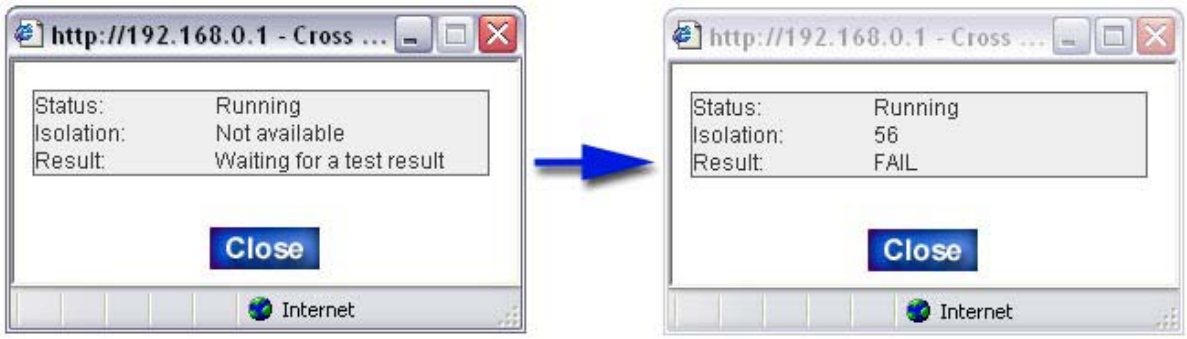

Address
http://192.168.0.1/fs/registration/acp.html
Go
DIRECWAY - Transmit Antenna Pointing (Auto Cross Pol)
In order to be able to transmit over the satellite, it is essential to have appropriate cross pol isolation. This screen will allow you to check the isolation values for the transmitter. Adjust the polarization of the antenna until the highest possible isolation is achieved.
Cross Pol Test Type:
Click on Manual Button
Automatic
Manual
Close the ACP result window when complete and click Exit to finish.
Back
Exit

Clicking on Manual makes a small POP up window appear:

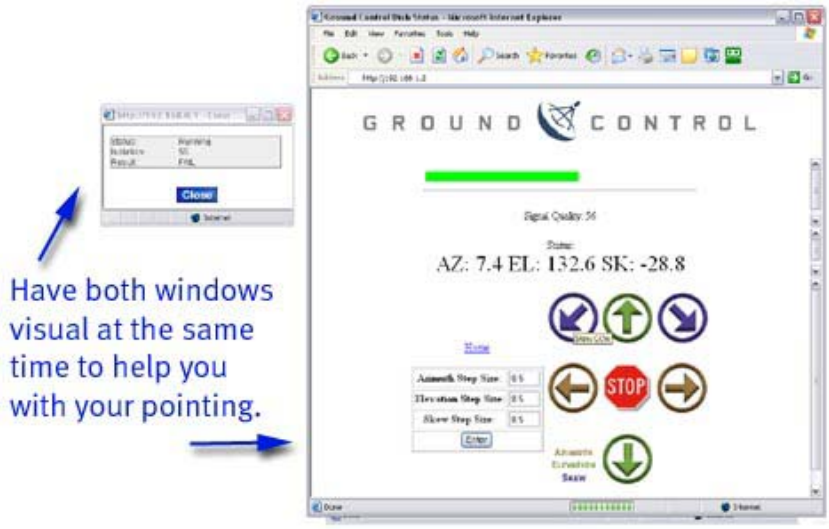

http://192.168.0.1/fs/registration/acp...
WARNING!
During the Manual Cross Pol test, the transmitter is actively powered on. To avoid exposure to transmit radiation, please make all adjustments to the antenna from behind the antenna.
Continue
Done
Internet

This is a safety warning to protect installers from standing in front of the dish during an installation. The danger zone on a satellite dish is between the LNB and the dish face. Be sure this area is clear at all times.

Click on Continue, and the window below appears:



The screen on the right shows a real time isolation reading of your skew. This isolation reading is also displayed on the MAGELLAN manual motor control screen.

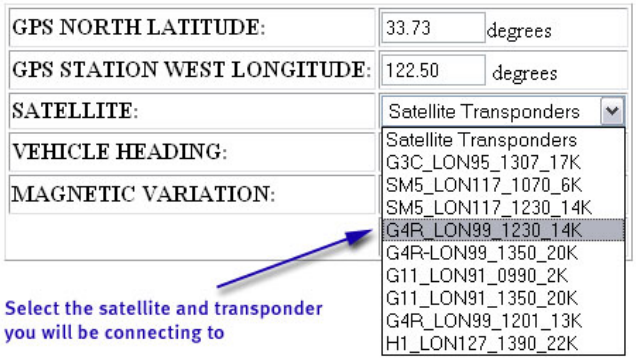


Here is the fun part… you want to move the skew of the dish by clicking on the skew buttons until you gain your highest isolation reading. (Sometimes, the meter will show that you are of a PASSING level. If you see the "PASS" appear (and stay) on the screen during the manual test (as seen below), you may stop the test and run the AUTOMATIC test to (hopefully) gain your PASS and finish the Cross Pol.

The Manual test will only run for 1 or 2 minutes, so you need to work quickly to get your best isolation score… Don't worry if the test stops too quickly… You can always rerun the test at any time. The idea is to get the highest isolation as possible. Sometimes you can slightly move Azimuth and Elevation to help with isolation scores.

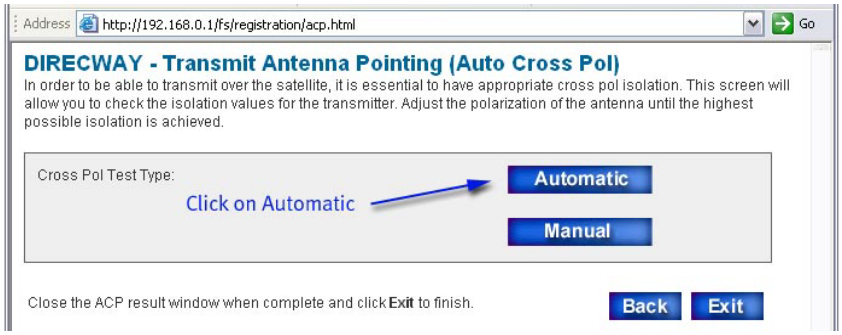
This procedure takes time to learn, and we recommend that you practice and perfect this skill.

HINT - If you can't pass, try using a different transponder. (Click on Override inside the INPUT DATA box on the Main MAGELLAN Administration Window)…. Choose your transponder from the list (as seen below)…make sure it is on the satellite you're pointed at.

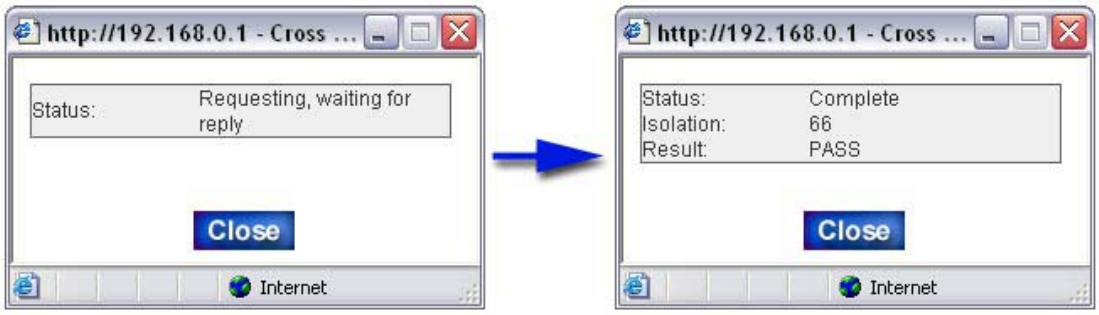


For more information on selecting transponders, read Step 4 of MAGELLAN Configuration in this manual.

Okay… now that you think you can pass cross pol (with the manual test), let's finish the test by pressing AUTOMATIC.


Address
http://192.168.0.1/fs/registration/acp.html
Go
DIRECWAY - Transmit Antenna Pointing (Auto Cross Pol)
In order to be able to transmit over the satellite, it is essential to have appropriate cross pol isolation. This screen will allow you to check the isolation values for the transmitter. Adjust the polarization of the antenna until the highest possible isolation is achieved.
Cross Pol Test Type:
Click on Automatic
Automatic
Manual
Close the ACP result window when complete and click Exit to finish.
Back
Exit

Clicking on Automatic bring up the Pop-Up window below:



The window on the right will appear, and if all goes, well, you'll get the window on the right in a few seconds. Congratulations… You've passed cross pol. Simply click on "Close" and start surfing the web.

If you get a "FAIL"… try re-running the Automatic test several times. If you still can't get on, then you'll have to either tweak the satellite dish motors, or change transponders.

That's it for Manual ACP!

APPENDIX E – Upgrading your MAGELLAN Flash Software

The MAGELLAN may be upgraded automatically when you are connected to the Internet. From the MAGELLAN main screen, click on the "Setup Screen" option, and click on "Download Software Update". If you are online, the MAGELLAN will automatically updated to the most recent version of software.

Another way to update is to go to www.groundcontrol.com/Magellan for using software to updates for the MAGELLAN. Instructions for this are also available from the page.

APPENDIX F – TROUBLESHOOTING

Ground Control Technical Support is available 24-7 at 805-542-0688 or by email at support@groundcontrol.com

APPENDIX G – SPECIFICATIONS

MAGELLAN SPECIFICATIONS

BANDWIDTH SERVICE (Via Direcway)

Download Speed……..	Normally 400 to 1500 Kbps
Upload Speed…….……..	Normally 30 to 100 Kbps
Public IP Address……..	Optional
Protocol…….	TDMA
VOIP Phone Service……	Included

SATELLITE DISH

Satellite Acquire Time (from stowed)..	Normally between 2-5 minutes
Automated Cross Poll acquisition……	Normally between 30 seconds to 2 minutes
Reflector Type……..	.74 Meter Effective Area Elliptical Offset
Mount Geometry……..	3 Axis Motor Drive (Elevation, Azimuth & Skew)
Polarization……...	Dish Rotation Cross-Pol Isolation automated
Deployment Sensors…….	GPS, Compass

MAXIMUM MOUNT ROTATION

Azimuth……	-25 to +385 (410 degrees total)
Elevation……...	152.5 degrees
Elevation Look Angles…….	0 to 76 Degrees from vertical
Skew…….	+/- 80 Degrees

NETWORK

DHCP……	Supported by included router
NAT…….	Supported by included router
Port Mapping……	Supported by included router
Networkable…….	Yes, no per-seat charges
Wi-Fi Access Point……..	Yes, included at no additional cost
Ethernet Port……	10/100 Mbps

RF INTERFACE

Transmit Power……	1 Watt
Receive Frequency……	Range 950-1450 mhz

DIMENSIONS

Dish Mounting Plate…….	22” wide x 48” long
Dish Stowed Dimensions…….	13” high x 39” wide x 48” long
Deployed Dish Height……...	Stands approximately 41” when deployed
Dish Weight (with mounting plate)…..	75 lbs
Dish Weight without mounting plate…	65 lbs
Shipping Weight……	120 lbs

ENVIRONMENT

Wind Deployed……..	40 MPH
Wind Stowed……..	140 MPH
Temperature……	Approx –20 degrees F to 120 degrees F